III. CONTRIBUTIONS TO A KNOWLEDGE OF THE ODONATA OF THE NEOTROPICAL REGION, EXCLUSIVE OF MEXICO AND CENTRAL AMERICA.

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In the collections which various museums loaned to me for study as material for the account of the Odonata lately published in the "Biologia Centrali-Americana," many species were represented, which do not form part of the Mexican-Central-American fauna, as far as we know. The present paper deals especially with these species, but does not pretend to give a complete list of Neotropical Odonata. Different groups have been treated with different degrees of fulness for various reasons, and the title of the paper, it is believed, exactly expresses its scope. Some of the "Biologia" records also have been repeated in order to add further information which lay outside the limitations of that group.

The largest part of the material here dealt with is the property of the Carnegie Museum of Pittsburgh, to the Director of which, Dr. W. J. Holland, I am indebted for the opportunity of studying it. Other parts come from the U. S. National Museum, thanks to Dr. L. O. Howard and the late Dr. W. H. Ashmead; from the Museum of Comparative Zoölogy, Cambridge, Mass., thanks to Mr. Samuel Henshaw; and from the Academy of Natural Sciences of Philadelphia, where Dr. Henry Skinner has given me the freest use of the Odonate collections. The original sources of these various collections are given below.

In the citation of previous literature the usual but not invariable rule has been to give no references, if Mr. Kirby's Catalogue of Odonata (1890) quotes all the important descriptions of a given species. If some later work deals with a species more fully, or gives the specific bibliography more completely, that work has been quoted.

The Comstock-Needham terminology of the wing-veins has been used, but, in order to facilitate comparisons with the older descriptions, the Comstock-Needham name of a vein is often followed by the Selysian name in parentheses, especially in the first part of the paper.

Finishing this manuscript on the eve of departure for Central America, it is a pleasure, as well as a duty, to acknowledge the kindness of Dr. Holland in undertaking the burden of proof-reading, which distance renders impracticable for the author.

The principal collections on which the paper is based are:

1. *Collections made in the northwestern corner of the Department of Magdalena, Colombia, adjoining Santa Marta, by Mr. and Mrs. Herbert H. Smith, between March, 1898, and September, 1901.*

Mr. Smith has given a description of this district of Santa Marta, with notes on the localities, in the Bulletins of the American Museum of Natural History, vol. xx, pp. 408–414, 1904. From these notes we extract the following having relation to the Odonata:

"*Bonda:* Village on the river Manzanares, seven miles east of Santa Marta. This was our headquarters during the greater part of our stay in Colombia. The village itself is only 150 feet above sea-level, but most collections were made in somewhat higher land. The country is hilly, covered in great part with dry forest with intervals of open grass land on the ridges. A thin line of mountain forest adjoins the river.

"*Cacagualito:* Plantation, twenty miles east of Santa Marta, 1,500 feet; vegetation principally mountain forest, which here extends to a lower level. Jordan is a plantation two miles further east, in a valley, at 1,000 feet.

"*Cienega*, or *La Cienega:* Town on the coast adjoining the great lagoon of the same name; the lagoon belongs to the estuary system of the Magdalena. The country around is flat, swampy in places, and with salt plains; two or three miles back are dry hills with a scrubby growth (dry-forest vegetation). Rio Frio is a town a few miles south of Cienega, on a river of the same name; Gaira, on the Gaira River, is between Cienega and Santa Marta, on low land. These towns are connected by a railroad.

"*Don Amo:* Plantation, eighteen miles east of Santa Marta, in a mountain valley, at 1,500 feet; large clearings in mountain forest, with adjoining dry forest and open lands. Don Amo Viejo is a locality near it.

"*Don Diego:* Plantation on the coast at the mouth of the river Don Diego, five miles east of the Buritaca, and with similar surface and vegetation" [*i. e.*, "The mountain forest here" — at Buritaca — "comes down bodily to the coast, where there are sand-beaches and mangrove-swamps; the country is low and damp. There are small tracts of open grass land near the river mouth"].

"*Minca:* Plantation on the river Gaira, twelve miles southeast of Santa Marta, at the lower border of the main mountain forest, which here adjoins dry forest and open grass lands. Elevation 2,000 feet.

"*Onaca:* Plantation, eighteen miles E.S.E. of Santa Marta, at the lower border of the main mountain forest, which here adjoins the open lands. Elevation 2,000 feet.

"*Valparaiso:* Plantation near the head of the river Gaira, twenty miles southeast of Santa Marta, 4,500 feet. Extensive clearings in the mountain forest. Las Purtidas is a locality near it at 3,500 feet."

Mr. Smith emphasizes the difference between mountain forest and dry forest, believing the difference to be interesting and significant. "The true mountain forest is a matted growth of trees and vines with numerous epiphytes and ferns; very few trees shed their leaves at stated seasons, and the forest is damp and verdant throughout the year. In the dry forests, on the contrary, nearly all the trees and vines are leafless during the latter part of the dry season, February to May; the few peculiar ferns die down to the roots. Grasses and herbs are abundant wherever the ground is not too shady, but they wither during the dry months. The distinction of plant species is almost complete, and is all the more remarkable because the two kinds of forest exist side by side." "I have been thus explicit in describing the two kinds of forest because they exist in all parts of tropical America. . . . The 'pampa' [dry forest] of the Santa Marta district is the 'campo' and 'coatingo' of Brazil, and the scrubby growth of lower hills in the West Indies; a modified form is the 'chapparal' of Mexico. Everywhere the plants are different from those of the swamp forest; generally the trees are lower, often small and gnarled and sometimes scattered; and everywhere they shed their leaves during the dry season. The difference does not always correspond to a difference of soil or situation; the two kinds of forest may adjoin each other on level ground or on a mountain side, on land equally dry or humid.

"It is impossible to avoid the impression that the dry forest is an old, stunted, and worn out vegetation, tending to extinction, while the swamp forest, with its exuberant growth, is plant life in the vigor of youth. . . . It is possible that the dry forest, with its open lands or 'campos,' represents an older flora.''[1]

2. *Collections Made in Brazil, Bolivia, Paraguay, and Argentina by Mr. and Mrs. H. H. Smith in 1885 and 1886.*

The following notes are taken from letters from Mr. Smith to the author, dated December 6, 1908 and April 24, 1905.

Brazil.

'' *Cachoeira :* This is a stream, or small river, which rises near Chapada, flows N. then N.E. and finds its way to the R. Cuyabá. The collections with this label were made at a place about fifteen miles N.E. of Chapada, where the river passes through a gap in the hills. Forest and grass-land with some boggy places. Practically the same as Chapada.

'' *Chapada :* A small village of Matto Grosso, Brazil, about twenty-five miles E.N.E. of Cuyabá, on the plateau. The village itself is about 2,500 ft. above sea level, or 1,800 ft. above Cuyabá; but collections are from all the surrounding region as low as 1,500 ft. This is a country of mixed forest and campo, or grass-land with scattered trees; there are many streams — some small lakes or ponds, and tracks of more or less boggy savanna where the streams rise.

''The name Chapada is really a generic appellation, applied to the plateau in general. The real name of this village is *Santa Anna La Chapada*, and in some maps it appears as *Santa Anna;* but in all that region it is known simply as Chapada, or *the* Chapada.

'' *Cuyabá:* The capital of Matto Grosso, on the R. Cuyabá, a branch of the Paraguay. There is very little flood-plain here; mostly rocky land, but well watered by streams.

'' *Corumbá :* A town on the River Paraguay, near the junction of the Taguary, the port of entry for Matto Grosso. There is a tract of dry rocky land, a kind of island, in the flood-plain of the Paraguay, which is here very extensive. Collections were made principally on the flood-plain; the waters were rising, but I used to wade about with a boy pushing a canoe through the grass behind me. These flood-plains are mostly open grass-land, with some forest along the river and channels.

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[1] For similar statements concerning the Brazilian flora and fauna see the notes by Mr. Smith prefixed to Mr. E. T. Cresson's '' Descriptions of Some Brazilian Mutilla'' (*Trans. Amer. Ent. Soc.*), xxviii, pp. 1–3. 1902.

" *Uacaryzal:* I am not quite sure of this locality. It is a plantation in Matto Grosso either near the R. Paraguay, or near Cuyabá. I *think* that it is on the Paraguay, not far above the junction of the R. Cuyabá ; at any rate, there is a cattle plantation there, where we worked for some time.

" You have only a fragment of my Matto Grosso collection of Odonata ; the only serious loss I had in transit was in this group. I had a large " Saratoga " trunk, packed full with specimens, mostly collected along the R. Paraguay in Matto Grosso. In transferring our luggage at Monte Video this trunk disappeared. It must have contained several thousands of specimens, and an especially fine lot. Those I did bring home were turned over to Dr. Hagen for study. After his death they remained at the Museum of Comparative Zoölogy until after I sold my collection to the Carnegie Museum. I have not seen them for 20 or 25 years, and have no idea what condition they are in. The trunk I mentioned contained a lot of the rare species, which fly only in the evening after sunset, and in the early morning. I used to get up before daylight to catch them. The colors of this species are rather dull.

" Along the Paraguay, just before leaving Matto Grosso, I made a discovery, which might have been very important had I remained there. The best time to get rare dragon-flies is before sunrise in the morning. Nearly all the species which are dull brownish or greenish in color — no pronounced tints — are either nocturnal, or at any rate, can be found flying as soon as there is light enough to see them. They also fly in the evening, but are less abundant then.

Bolivia.

" *Piedra Blanca* (in Portuguese Pedra Branca). A small trading station and custom house, four miles W. of Corumbá, and just within the boundary of Bolivia. A road runs from here over the plains to the larger Bolivian towns of the Andes. Piedra Blanca is on the edge of the flood-plain of the R. Paraguay ; there is a lake communicating with the river near Corumbá. Practically the collections are the same as those of Corumbá, and I only kept them separate because they are from within the confines of Bolivia.

Paraguay.

" *Villeta,* a village in Paraguay, as I remember, about twenty miles S. of Asuncion ; at any rate it is a village on the R. Paraguay, noted for its orange groves. The collections were made close to the river."

To many of his specimens Mr. Smith attached numbers, corresponding to those under which he made notes on the living colors of the insects. The note-book containing these is, unfortunately, not available, but I have preserved his numbers in the following text in the event of these notes coming to light in the future.

3. *Collections Made by Mr. J. D. Haseman, in Various Parts of Brazil, in 1907 and 1908.*

I have no information concerning them other than that given on the labels, which are here quoted exactly, nor have I been able to locate many of his localities on the maps.

The collections by Mr. and Mrs. Smith and Mr. Haseman are in the Carnegie Museum, Pittsburgh.

4. *Collections Made at Sapucay, Paraguay, by Mr. W. T. Foster, now in the U. S. National Museum.*

Mr. A. N. Caudell, in his paper "On a Collection of Non-Saltatorial Orthoptera from Paraguay" (Journ. N. Y. Ent. Soc., xii, pages 179, 180, Sept., 1904), gives the following information about this locality, quoting from a letter from Mr. Foster, dated May 14, 1902. "Sapucay is a small village situated at the base of a low table-land, the elevation of which is 800 feet above the surrounding country. . . . The trend of the face of the table-land is northwest and southeast. The country to the southwest and east is generally level, broken by low hills rising abruptly from the plains, which extend to the level cattle-breeding lands of the Missions, which in turn give place to the low swamp-land of the southwest corner of Paraguay, which, with the exception of a narrow fringe along the rivers Paraguay and Alto Parana, is given over to the anaconda and tiger (jaguar). I was several months down there collecting water-birds, but do not have any very pleasant recollections of the district. Periodical floods extend for leagues inland, filling up the swamps, which in turn extend for miles; patches of forest from a few hundred feet to a mile in diameter occupy any land rising a few feet above the swamp. A few wandering tribes roam the large forests of the Alto Parana, but the rest is a desolate waste.

"I do not find that the table-land mentioned above bears a different fauna than that of the low lands, nearly all specimens taken by my collecting boys on the higher lands being duplicated by others from the plains.

"The winter is now about commencing and the frost during the months of June and July is somewhat severe, with the result that insects are correspondingly scarce. I therefore do but little collecting during the winter months, but turn my attentions to bird and mammal skinning."

5. *Collections, not yet Fully Worked Out, Made by Mr. W. J. Gerhard in Peru and Bolivia, in 1898 and 1899, now in the Academy of Natural Sciences of Philadelphia.*

Mr. Gerhard's itinerary is given on pages 11–27 of Andrew Gray Weeks, Jr.'s "Illustrations of Diurnal Lepidoptera With Descriptions. Boston Printed by the University Press Cambridge, U. S. A. 1905."

LIST AND DESCRIPTIONS OF SPECIES.

1. **Lais guttifera** Selys.

♂. Individuals vary as to the presence or absence of occipital tubercles. The yellow of the inferior part of the metepimeron is one-third to one-fourth as wide as the sclerite and is absent in the oldest examples. Pale, cleft, anterior lamina one-third to two-fifths as long as segment two, posterior hamule very hairy anteriorly. Young males have hardly any coloring at the tip of the hind wings. Tips of the inferior appendages in profile view slightly bifid, upper branch curved upward and cephalad.

Dimensions. — *Chapada :* abdomen ♂ 35.5–37, ♀ 30.5–34 ; hind wing ♂ 25.5–28, ♀ 26.5–28 mm.

Sapucay : abdomen ♂ 37.5–40.5, ♀ 34 ; hind wing ♂ 28–30, ♀ 29 mm.

Habitat. — Brazil : Chapada, by H .H. Smith, 6 ♂ and parts of 8 others, 5 ♀ and parts of 7 others. Carnegie Museum, Pittsburgh. Paraguay : Sapucay, by W. T. Foster, December, 1899, 1 ♂ No. 69 ; January, 1900, 2 ♂ no. 69 ; February, 1900, 1 ♂, 1 ♀. United States National Museum.

2. **Lais fulgida** Selys.

Founded on a young male from Rio Napo, Ecuador, " de sorte que la gouttelette terminale obscure des ailes inférieures n'est que faiblement indiquée."

In 1880, de Selys wrote (Compt.-Rend. Soc. Ent. Belg., 1880, p. 1) : " La *fulgida* différerait des trois autres [*hauxwelli*, *devillei*, *cupræa*] par le bout des ailes inférieures du male sans gouttelette obscure, mais légèrement grisâtre, se rapprochant ainsi de la *metallica* dont elle n'est peut-être pas distincte."

The present pair from Iquitos were labeled " fulgida ? ", representing possibly Hagen's identification. They agree with the original description of *fulgida* in size, in the brilliant coppery color of thorax and of abdomen, and in the superior appendages of the male. The hind wings of the male, however, have a well-marked brown spot at the apex similar to that of *L. hauxwelli.*[2] The male is also like *hauxwelli* in having the inferior appendages undeveloped. *Fulgida* therefore belongs to the same group of species as *hauxwelli* and should be so transferred in de Selys' synopsis of the genus, *l. c.*, p. li. Like *guttifera*, *devillei*,[3] and doubtless other species, the young males of *fulgida* have the apical brown spot of the hind wing not yet distinctly developed.

Habitat. — Peru: Iquitos, Staudinger, 1 ♂, 1 ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

3. **Lais pruinosa** Selys.

The male has a pair of occipital tubercles, inferior half of the metepimeron yellow, the pale cleft anterior lamina one-fourth as long as 2, the posterior hamule not hairy anteriorly.

Habitat. — Brazil: Rio Grande do Sul, by H. H. Smith, 1 ♂ (lacking the tip of the abdomen), 1 ♀. Carnegie Museum, Pittsburgh.

4. **Lais pudica** Selys.

(Plate IX, figs. 149–151, 155.)

The wings of young males are brown without any red (except the apices which remain uncolored throughout life). Subsequently, red appears in the midst of the brown and gradually occupies the whole of the previously brown area.

The wings of the female remain brownish throughout life, although this color occupies a smaller area than in the male.

Habitat. — Brazil: Chapada, by H. H. Smith, 1 ♂ and parts of 4 others No. 73, 2 ♀ and parts of 4 others No. 76. Carnegie Museum, Pittsburgh. São Paulo, March 28, 1900, 1 ♂, 3 ♀; and Rebouças, September 26, 1900, 1 ♂, collected by A. Hempel. Academy of Natural Sciences, Philadelphia.

Paraguay: Sapucay, January 16, 1903, by W. T. Foster, 6 ♂ No. 17, 6 ♀ No. 6. U. S. National Museum.

5. **Hetærina fuscibasis** sp. nov.

(Plate I, figs. 1, 2; Plate IX, figs. 152, 153.)

♂. Black, except as follows: second joint of antennæ brown anteriorly, two elongated pale brown spots on the second lateral thoracic

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[2] There is a pair of *hauxwelli* from Brazil (no definite locality) in the Carnegie Museum, Pittsburgh.

[3] Cf. Selys, *l. c.*, p. l.

suture, thorax with slight metallic-green or metallic-copper reflections, anterior abdominal segments with slight metallic-violet or metallic-green reflections ; labrum in a younger male with a pale spot on each side.

Superior abdominal appendages longer than 10, as long as 9, forcipate, black outer margin with 4–5 spines in the distal half, inner margin widening gradually from the first to the second third of the appendage length ; beyond the point of greatest length the upper surface bears an oblique row of small denticles and distal to the row a transverse ridge, the inner (mesal) end of which forms a slight projection on the inner edge of the appendage at three-fourths length when seen from above, apex obtuse, rounded. In profile the lower margin is distinctly convex in the third and fourth fifths, or middle third, of the appendage length, corresponding to the widening of the inner margin as viewed from above.

Inferior appendages five- to six-tenths as long as the superiors, black ; in profile view curved slightly upward, tapering from base to apex ; in ventral view, as distant from each other as the superiors, only slightly curved toward each other.

Legs black.

Wings dark brown for their entire width from base to nodus, uncolored beyond, the outer edge of the brown extending in a usually somewhat zig-zag line to the hind margin of the wing in such a way that the hind edge of the brown is a little shorter (9–10 mm.) than its front edge (10–11 mm.). Apex of hind wing edged with brown from the second to the sixth cell before the termination of R_1 (= median vein of de Selys) to the termination of the second of the three longer supplementary sectors below M_1 (= principal sector of de Selys), or 2–3 cells posterior or anterior thereto. No trace of a pterostigma. Front wings with two or three rows of cells in the greater part of the anal area (= proximal part of the postcostal space of de Selys) to the level of the distal end of the quadrilateral, when there are two rows, then near the distal end of that area are three rows or three cells here and there ; three or four rows in a great (middle) part of second cubital area[4] (=distal part of the postcostal space of de Selys); 3–5 cross-veins in the basal median area (= median space of de Selys, 1896), 4–7 cross-veins in the quadrilateral, 17–19 ante-, 29–35 postnodals. Hind wings with never more than two rows of cells in any part of the anal area, with two (56 per cent.) or three (44 per cent.) rows at most in the second cubital area (16 wings examined), 3–6 cross-veins in the basal median area, 4–6 cross-veins in the quadrilateral.

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[4] Mr. Williamson has denoted this area also by the letters AN AR, *anal area*, in his figure 1 (page 168, Proc. U. S. Nat. Mus., xxviii) showing the nomenclature of he venation of a Calopterygine wing.

♀. Differs from the male in being dark metallic-green with the following parts pale yellowish: anterior surface of the second antennal joint, labrum (except at base, which is black, and a median black line, absent in some), external surfaces of mandibles, proximal parts of the lateral labial lobes, a narrow longitudinal stripe (absent in some) on each side of the middle prothoracic lobe and another on the inferior margin of the prothorax each side, a short inferior mesepisternal stripe bordering the lower end of the humeral suture anteriorly, a subequally long, but narrower posthumeral stripe on the middle of the mesepimeron, an elongated spot on the lower end of the same sclerite, a small spot on the mesinfraepisternum, a stripe (reduced or interrupted in some) on the first lateral suture, two spots (absent in some) on the hind margin of the metepisternum, the lower larger and confluent with the yellow which covers most of the metinfraepisternum, most of the metepimeron (except for a median longitudinal black or metallic-green stripe) wider at its upper end, where it does not reach the base of the hind wing, pectus, which, however, is encircled and transversely crossed with black, in some the margins of the antealar sinus and of wing-bases, a longitudinal lateral stripe on 1–2, 3 or 4, a narrow transverse basal mid-dorsally interrupted ring on 1–7, sides inferiorly of 9 and 10, the genital valves, spots on the coxæ, and a stripe on the proximal third of the second, half of the third, femora.

Abdominal segment 10 with a mid-dorsal longitudinal carina on its posterior half, carina prolonged into a short acute spine projecting beyond the hind margin of the segment, which last is produced slightly backward above and below each abdominal appendage, the produced parts denticulated or spinulose; appendages not quite as long as 10, very acute at tips. Genital valves minutely denticulated.

Wings pale yellowish-brown from base to nodus, this color fading gradually toward the hind margin, at least distal to the level of the quadrilateral; remainder of the wings much clearer. Anal area of front and hind wings and second cubital area of hind wings with never more than two rows of cells, second cubital area of front wings with three rows in its middle. Front wings with 4–6 cross-veins in the basal median area and in the quadrilateral, 16–20 ante-, 27–33 postnodals. Hind wings with 3–5 cross-veins in the basal median area and in the quadrilateral.

Abdomen ♂ 31–32, ♀ 27–28; hind wing ♂ 22–24, ♀ 23–25 mm.

Habitat. — Brazil: Chapada, in May, by H. H. Smith, 2 ♂ and parts of six others, 2 ♀ and parts of six others. Carnegie Museum, Pittsburgh.

This species differs from all other known species of the genus, except *H. borchgravii*, by the entire absence of red on the wings of the male. The brown on these organs recalls *Hetærina titia* Drury, of the extreme southern United States, Mexico, and Central America, but in that species it has been shown,[5] that, while brown first appears on the wings of the teneral individuals, subsequently red is indicated by a pale pink wash over the brown at the base of the front wings. This pink becomes a deeper and deeper red, while the brown is at the same time darkening. No trace of red is apparent in any of the present material of *Hetærina fuscibasis*, although different ages are represented. If the ontogenetic order of the colors on the wings of *Hetærina* males, as described for *H. titia*, *H. capitalis*[6] and *H. tolteca*,[7] has a phylogenetic significance, then *Hetærina fuscibasis* has some claim to be regarded as representing an original, partly brown-winged form, from which the majority of present-day Hetærinæ, with their red-based wings, have sprung.

It will also be noticed that the considerable variation in the number of rows of cells in the second cubital area of the hind wings of the male seriously invalidates the grouping of the species of this genus proposed in the work just cited.[8]

6. **Hetærina rosea** Selys.

Habitat. — Brazil: Chapada, by H. H. Smith, 7 ♂ and parts of 8 others, No. 182; parts of 21 ♀, Nos. 46, 182. Carnegie Museum, Pittsburgh.

7. **Hetærina caja** Drury.

Calvert, Biologia Centrali-Americana, Neuroptera, pp. 21, 33, 1901.

Habitat. — Colombia: Bonda in Dept. Magdalena, by H. H. Smith, August, 2 ♂. Carnegie Museum, Pittsburgh.

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[5] Calvert, Biol. Centr.-Amer. Neuropt., p. 32, 1901.

[6] Calvert, *ibid.*, p. 347, 1907.

[7] *Ibid.*, p. 348.

[8] *Ibid.*, pp. 20–22, 342–343.

8. **Hetærina donna** Selys.

Habitat.— Brazil: Bom Fim in Bahia State, November 20 and 21, 1907, at the Fazenda de Amaratu, by J. D. Haseman, 4 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

Paraguay: Sapucay, by W. T. Foster; November, 1899, 6 ♂ (No. 19), 5 ♀ (No. 20); January 10 and 16, 1900, 1 ♀ (no number) and 1 ♂ (No. 21); February, 1900, 1 ♀ (no number). United States National Museum.

9. **Hetærina auripennis** Burmeister.

Habitat.— Brazil: Muniz Freire in Espiritu Santo, June 18, 1908, by J. D. Haseman, 2 ♂. Carnegie Museum, Pittsburgh.

10. **Hetærina hebe** Selys.

Hetærina hebe Selys, Syn. Calopt., p. 34, 1853; Monog. Calopt., p. 112, pl. 11, fig. 3, 1854.

Two of the present males have the humeral suture occupied by a narrow yellowish stripe for its whole length, but the third (S. Sebastião) has it yellow only for its lower half, the upper half black, thus furnishing the intermediate conditions between those described by de Selys (1854) for the adult ♂ and the young ♂.

The superior appendages of all show a detail not mentioned by de Selys, nor shown in the figures, and which is to be seen only in a supero-internal view, not in dorsal or profile; it is that the dilatation of the inferior inner margin, which forms "une plaque triangulaire obtuse," at mid-length of the appendage is not uninterrupted, but emarginate at one-fourth the appendage length, at which point the "plaque" may be said to begin.

De Selys knew this species only as from "Brésil," wherefore the value of the more exact localities which follow.

Habitat. — Brazil: Rio Janeiro, December, by H. H. Smith, 1 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

São Sebastião, November, 1900, by A. Hempel, 2 ♂. Academy of Natural Sciences of Philadelphia.

11. **Hetærina longipes** Selys.

The present male is smaller than the type, having the abdomen 41, hind wing 31 mm. Humeral and first lateral yellow stripes narrower, not wider, than in *H. carnifex* from Nova Friburgo, and not anastomosing above near the wings. Metasternum margined with a narrow black stripe ("la cercle noire de la poitrine"), and with a median longitudinal black stripe on its anterior half and a transverse isolated black mark near its hind end.

Habitat. — BRAZIL: Santa Catherina, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

12. **Hetærina macropus** Selys.

Hetærina macropus Calvert, Biol. Centr.-Amer. Neurop., pp. 21, 34, 346, 1901, 1907.

Habitat. — COLOMBIA: Bonda, July, 2 ♀, August, 4 ♂, 5 ♀, September, 2 ♂, 1 ♀, October, 1 ♂, 3 ♀, November, 2 ♂, 1 ♀; Onaca, August, 2 ♂, 2 ♀; Cacagualito, August, 1 ♀; all in Dept. Magdalena, by H. H. Smith. Carnegie Museum, Pittsburgh.

VENEZULA: La Guaira, by Lyon and Robinson, July 3, 1900, 6 ♂; San Julian, by M. W. Lyon, Jr., July 20, 1900, 4 ♀. U. S. National Museum.

13. **Hetærina charca** sp. nov.

(PLATE I, FIGS. 3–5.)

♂. Head black, some metallic-coppery reflections on the upper surface; rhinarium, external surface of mandibles, a small adjoining spot on the genæ, a smaller spot on each side of the labrum, submentum, mentum, and some adjoining parts of the labium, *pale yellow.*

Thorax metallic-green or coppery, the following markings *pale yellowish-brown* or *orange-brown*: a humeral stripe wider below, most of the metapleura (excepting a median dark stripe on the metepisternum reaching from the upper margin of that sclerite down to, or almost to, or half-way to, the metastigma, and a subequally wide or narrower median dark stripe on the metepimeron which reaches to neither the upper nor the lower margins of the sclerite, or the metepisternal stripe broken into two isolated upper and lower streaks, and only a short superior line to represent the metepimeral), a postero-inferior spot on, or all of, the mesinfraepisternum, the metasternum (except for a transverse terminal posterior blackish band). Anterior mesothoracic margin, mid-dorsal carina, upper margin of mesopleura and metepisternum, *black.* Hind lobe of prothorax produced posteriorly.

Abdominal segments 1–4 or 5 pale reddish-brown, 1 with a posterior dorsal metallic-green spot, terminal fourth of 2 darker brown, posterior eighth of 3 and 4 or 5 dark brown or almost blackish; 5 or 6–10 black, mid-dorsal carina of 10 terminating posteriorly in a short projecting spine.

Superior abdominal appendages longer than 10, almost as long as 9, forcipate, black, with a small superior basal orange spot, with 6–8 spines on the outer margin in the apical half. In dorsal view, the inner margin is slightly and convexly enlarged in the proximal third; and from one-third to four-fifths' length is again widened into a large trilobed or tridentate prominence, the first or most proximal tooth or lobe being rounded at tip and situated at one-half the appendage-length, where the appendage reaches its maximum width; the second is more rectangular at tip and at five-sevenths of the appendage length; the third, also rectangular, is at about four-fifths' length, less prominent, but at a higher level than the other two; the upper surface of the appendage bears an oblique row of a few denticles above the proximal tooth or lobe of these three and running towards the second tooth; apex of the appendage obtuse, rounded.

Inferior appendages black, reaching to three-fifths of the length of the superiors, tapering gradually to the apices, which are slightly curved toward each other and minutely bidentate.

Legs black, except the coxæ, which are pale brown with some black spots; in one a pale line on the inner surface of the third femur. All wings pale yellowish between the costa and R_1 (= median vein of de Selys), and with a red spot at the tip between the distal ends of R_1 and M_1 and M_{1c} or M_{1d} and extending proximad 5–9 cells posterior to M_{1b}, a little mere densely reticulated than adjoining areas. Red at the base of the front wing occupying the area between R (= median vein of de Selys) and the hind margin from base to about 5–7 cells distal to the quadrilateral; it also fills the subcostal area for the same distance, or for the first 6–11 antenodals, and narrowly borders the posterior edge of the costal space for the first 3–13 antenodals; the length of the red area from wing-base distad is 6.5–7.5 mm., or a little less or more than half the distance (13 mm.) from base to nodus. Red at the base of the hind wing occupying the area between costa and anal veins (at which latter it may stop sharply or invade the first row of cells below), from base to apex of quadrilateral whence its distal margin extends forward and outward to a point on R_1 (= median vein of de Selys) situated at about five cells distal to the level of the apex of the quadrilateral and 7.5 mm. from the wing-base, whence it again retreats towards the base through the subcostal and costal areas, in which two areas the red is paler and mixed or alternated with brown.

Median space of both front and hind wings, and often also the quadrilateral of hind wings, with two rows of cells (or at least some double cells) in the distal part of each; distal parts of the quadrilateral and cubital space, and all of the anal area of the front wings, as well as the proximal ends of the areas immediately distal to those named, filled with numerous small closely-set areoles; cubital space of the hind wings with one row of cells throughout, anal area of the same with two rows except at its extreme proximal end. Area Cu_2 on front wings in most cases with three rows of cells for part of its length, on hind wings with two rows. No vestige of a pterostigma. Front wings with 26–32 antenodals, 38–43 postnodals.

♀. Differs from the male as follows: second antennal joint yellow; labrum chiefly yellow, its base, anterior margin, and a median line (sometimes interrupted) black; yellowish-brown humeral area much widened not only by encroachment, especially at the lower or anterior end, on the dark mid-dorsal coloring, but also on that of the mesepimeron, which sclerite is thereby predominantly pale colored; metepimeral dark stripe reduced in length and width; posterior margin of abdominal segment 10 produced inferiorly into two subacute processes on each side, the upper of the two larger and spinulose; abdominal appendages subequal in length to 10, straight, conical, apex acute, blackish, but pale brown at base; femora pale brown inferiorly; wings greenish-yellow, unmarked, but the areas corresponding to those occupied by the apical red spots of the male are slightly more densely reticulated than adjoining areas, to about the same degree as in the male; quadrilaterals and cubital spaces and in some also the median spaces of all the wings, as well as the areas immediately distal, containing but one row of cells each; anal area of the front wings of but two rows of cells, of the hind wings of two rows in its distal part only; area Cu_2 on front wings with 3 (75 per cent.) or 2 (25 per cent.) rows of cells, on hind wings with two rows, rarely 3; front wings with 22–25 antenodals, 30–40 postnodals.

Young ♀. — Frons and nasus pale brown, the latter with some metallic reflection, thorax pale brown, none of the markings distinct, metapleura still paler, abdomen and legs brown throughout; otherwise as in the older females.

Dimensions. — Abdomen ♂ 41–43, ♀ 32–36; hind wing ♂ 30–31.5, ♀ 29–33 mm.

Habitat. — BOLIVIA: Chulumani, November 30, 1898, to January 5, 1899, 4 ♂, 8 ♀; twelve miles northeast of Coroico, May 20 and

24, 1899, 2 ♂; near Coroico, June 3, 1899, 1 ♂; all by W. J. Gerhard. Academy of Natural Sciences of Philadelphia.

The specific name is taken from that of a human tribe of the neighborhood.

14. Heliocharis amazona.

(PLATE VIII, FIG. 139.)

Heliocharis amazona Selys, Syn. Calopt., p. 55, 1853; Monog. Calopt., p. 188, pl. 5, fig. 5 (wing), pl. 14, fig. 5 (apps. ♂), 1854; Bull. Acad. Belg. (2), xxvii, p. 661, 1869.

The type "♂ jeune" from Ega, on which were based the descriptions of 1853 and 1854, was stated to have "le dessus du thorax olivâtre," no mention being made of any dark markings. The description of 1869, of a male from Para, reads "Devant du thorax verdâtre avec une raie à la suture dorsale, une antéhumérale et une double humérale noirâtres." The present material has a very distinct narrow black stripe on the mid-dorsal thoracic carina, but any humeral or antehumeral markings are very indistinct and doubtful, although the sides and ventral surface of the thorax are partly pruinose.

The abdomen, of which very brief mention is made in the descriptions, is greenish at its base (segments 1 and 2), blue on the following segments, with these black or blackish-brown markings: the intersegmental articulations, a narrow mid-dorsal stripe reaching the entire length of each segment from 2–10, having a hastate form on 2–6, the anterior third of 10, a longitudinal lateral stripe on 2–10 as long as the segments, not confluent with the mid-dorsal stripe except at the intersegmental articulations and at the base of 10.

Anal vein (= postcostal of de Selys) separating from the hind margin (*i. e.*, wings ceasing to be petiolated) distinctly proximal to the level of the arculus and at, or proximal to, the level of the cubito-anal cross-vein. M_{1+2} (= principal sector of de Selys) separating from M_3 (= median sector of de Selys) 2–2½ cells beyond the level of the distal end of the quadrilateral on the front wings, 1–1½ cells on the hind. Distance from base to nodus 14 (front wings), 12–12.5 (hind wings); from base to proximal end of stigma 26.5–27 (front), 24 (hind) mm. Quadrilateral with one cross-vein, except in one front wing and one hind wing. Median area (= basilar, Selys) with 1–4 (front wings), 2–3 (hind wings) cross-veins. One row of cells throughout the entire second cubital area (= espace postcostal, Selys). Two (in one front wing 3) basal subcostal cross-veins on all the wings.

Labium almost exactly as figured for *Dicterias atrosanguinea* (Monog. Calopt. pl. 8, fig. 12).

Abdomen 35–36 mm., hind wing 28.5–29 mm.

Habitat. — BRAZIL: Chapada, by H. H. Smith, 2 ♂, one numbered 26 by the collector. Carnegie Museum, Pittsburgh.

♀. Thorax as above described for the males but without any pruinosity. Abdomen evidently much faded, but apparently it was of a pale color without black stripes or markings. Abdominal segments 8 and 9 of nearly equal length dorsally, 10 half as long as 9 with a mid-dorsal carina for its entire length, hind margin entire. Appendages a little longer than 10, straight, simple, tapering, apices very acute. Genital valves reaching caudad almost to the level of the hind end of 11 (anal tubercle), their "palps" subequal in length to the mid-dorsum of 10.

Venation as described for the Chapada males except as follows: point of separation of M_{1+2} from M_3 only one cell distal to the level of the distal end of the quadrilateral on the front wings, one cross-vein in the median area of all the wings, only one basal subcostal cross-vein on the wings of the left side, both front and hind.

Abdomen 33; hind wing, 29.5 mm.

Habitat. — BRAZIL: Rio Sapon, January 30, 1908, by J. D. Haseman, 1 ♀. Carnegie Museum, Pittsburgh.

As will be seen from the above descriptions, these three specimens not only combine some features of *H. amazona* and of *H. libera* Selys, but also differ in some respects, *e. g.*, the extent of petiolation of the wing, from the characters laid down for the genus. So few specimens of *Heliocharis* have been examined, however, that we are not yet in a position to say which of the venational differences are individual variations and which represent more fundamental features.

15. **Chalcopteryx rutilans** Rambur.

Prof. Needham has figured the venation of this brilliant species in the Proceedings of the United States National Museum, xxvi, p. 729, fig. 22, 1903.

Habitat. — BRAZIL: Apehu, State of Para, November 1, 1892 [by Schultz?], 1 ♂. Collection of P. P. Calvert ex. coll. Selys.

Chapada, by H. H. Smith, 1 ♂ and parts of eight others, No. 75. Carnegie Museum, Pittsburgh.

16. **Euthore fasciata inlactea** subsp. nov.

♂. Differs from *fasciata* type chiefly by the absence of all milky-white color from the wings, the specimens appearing to be fully mature.

Front wings with 24–26 antenodals, 31–32 postnodals, a dark brown band, the proximal edge of which is straight and nearly transverse to long axis of the wing, begins at the tenth or eleventh postnodal and ends at the level of the 25th to 28th postnodal, its distal edge less regular and more oblique and proximal to the stigma; this band reaches from the anterior to the posterior margin of the wing, narrowing a little posteriorly, its extent along M_2 (= nodal sector, Selys) 6–6.5 mm.

Hind wings with a similar band, the distal edge of which is more oblique and reaches to the stigma, and narrows proportionally more than on the front wings.

Abdomen 35, hind wing 26.5 mm.

Habitat. — Peru: Piches and Perene Valleys, 2,000–3,000 feet, Soc. Geog. de Lima, 2 ♂. U. S. National Museum.

17. **Ortholestes clara** Calvert.

Ortholestes clara Calvert, Entom. News, ii, p. 199, 1891; Proc. Acad. Nat. Sci. Phila., 1893, p. 380, figs. 1, 2 (venation, apps. ♂); McLachlan, Ann. Mag. Nat. Hist. (6), xvi, p. 19, 1896.

This species was originally described from Jamaica, and the following species from Hayti. The late Mr. McLachlan recorded *O. clara* from Hayti, where we should have expected *O. abbotti*. His specimens came from Samana Bay; two of them, which he subsequently gave to me, are before me and I agree in his identification. There are also specimens from the same locality, by Frazar, in the Museum of Comparative Zoölogy, Cambridge, Mass.

18. **Ortholestes abbotti** Calvert.

Ortholestes abbotti Calvert, Proc. Acad. Nat. Sci. Phila., 1893, p. 382, fig. 3 (apps. ♂).

Hypolestes trinitatis Hagen, Proc. Bost. Soc. Nat. Hist., xi, p. 290, 1867 (no description).

Habitat. — Cuba: by Poey, 1865, 1 ♂ 1 ♀, numbered $\frac{119}{33}$ and with the label "L. trinitatis" in de Selys' hand; 1 ♂ 1 ♀, numbered $\frac{118}{32}$. Museum of Comparative Zoölogy, Cambridge, Mass. Hagen (*l. c.*) quoted this species in his "Odonate-Fauna of the Island of

Cuba" as from "Near the town of Trinidad, also at Bayamo, in July and August." Mr. McLachlan (*l. c.*, p. 20) refers to this species as from the "*island* of Trinidad," perhaps erroneously.

I can find no differences between these two females and that of *O. clara* from Jamaica.

The genus *Ortholestes* is, so far as known, confined to the West Indies.

19. **Archilestes grandis** Rambur.

Archilestes grandis Calvert, Biol. Centr.-Amer. Neurop., pp. 46, 350, 1901, 1907.

Habitat. — Colombia: Cacagualito in Dept. Magdalena, September, 1 ♂, November, 1 ♀, by H. H. Smith. Carnegie Museum, Pittsburgh.

Genus Lestes.

De Selys grouped the Neotropical species of *Lestes* (excluding those continental forms found not farther south than Central America) as follows:[9]

Rear of the head bronze or blackish, inferior appendages of the male long.
minutus (Brazil), *sublatus* (Surinam).
Rear of the head yellow, inferior appendages of the male long.
forficula (Brazil), *striatus* (Venezuela), *spumarius* (Porto Rico).
Rear of the head yellow, inferior appendages of the male short.
exoletus (Brazil), *undulatus* (Chile), *auritus* (Brazil), *tricolor* (South America), *pictus* (Brazil), *tenuatus* (West Indies, etc.).

Of these eleven species I know but six, which, with six hitherto undescribed, may be grouped under a slight modification of de Selys' arrangement as follows:

Rear of the head chiefly dark-colored, inferior appendages of the male almost or quite as long as the superiors.
scalaris n. sp. (West Indies), *bipupillatus* n. sp. (Brazil).
Rear of the head chiefly pale-colored, inferior appendages of the male more than half as long as the superiors.
forficula, *spumarius*, *mediorufus* n. sp. (Brazil), *paulistus* n. sp. (Brazil).
Rear of the head chiefly pale-colored, inferior appendages of the male half, or less than half, as long as the superiors.
pictus, *tricolor*, *tenuatus*, *dichrostigma* n. sp. (Brazil), *undulatus*, *quadristriatus* n. sp. (Brazil).

The objections to such an arrangement are that in some species the pale color of the rear of the head becomes dark with age and that no means of distinguishing the females of the second and third groups is afforded. With at least one-third of the South American species unknown to me, I do not care to undertake a revision of the neotropical members of this cosmopolitan genus, but I have given descriptions and figures of the pectoral color markings, which seem distinctive specifically, and which appear to be identical, or nearly so, in both sexes of the same species. These will aid greatly in the identifications, I hope, although they too have the disadvantage of being obscured in some cases by pruinosity in age.

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[9] *Bull. Acad. Belg.* (2), xiii, pp. 298, 308, 310, 1862.

20. **Lestes scalaris** sp. nov.

(Plate I, figs. 6, 17, 18.)

Lestes scalaris Hagen, Proc. Bost. Soc. Nat. Hist., xi, p. 289, 1867 (no description).

♂ (*Young*). Dorsal surface of head metallic-green; a spot caudolaterad to each lateral ocellus, frons, clypeus, labrum, and genæ pale brown; rear of head obscure, except around the occipital foramen, which with the labium is pale yellow.

Thorax pale yellowish-brown, each mesepisternum with a somewhat metallic bluish-brown stripe, attaining the anterior mesothoracic margin, gradually narrowing upward from .36 mm. near its lower end to .24 mm. at five-sevenths' length where it abruptly widens on its outer side to .5 mm., the outer edge thence continuing as a straight line, the inner (mesial) edge curving outward to meet it at an angle of 45°–50° and without quite reaching the antealar sinus; at mid-height this mesepisternal stripe is about .16 mm. distant from the mid-dorsal carina. Mesepimeron with an irregular bluish-brown stripe apparently composed of two elongated spots — the upper the longer — connected by a line. The markings of the pectus consist of an elongated dark brown metepimeral spot superior to the anterior end of the latero-ventral carina, a brown spot between the two branches of the posterior fork of the same carina, and the following brown metasternal markings: a streak parallel to the latero-ventral carina and lying posterior to the level of the anterior metepimeral spot, a pair of round spots near the hind end of the mid-ventral groove, and a median posterior spot.

Dorsum of abdominal segments brownish, with metallic-blue reflection, sides inferiorly paler, apical fifth or sixth of 3–7 forming a darker ring.

Superior abdominal appendages yellowish in the proximal half, darker distally. (For description of shape see next stage.)

Legs yellowish with indistinct darker lines. Pterostigma pale brown.

♂ (*Older*). Dorsal and posterior surfaces of head dark metallic-green passing into blackish-brown on frons and nasus; labrum, external surfaces of mandibles, and genæ below the level of the frons, pale blue; extreme free margin of labrum, lower surface of mandibles, labium, and borders of occipital foramen pale yellow.

Prothorax obscure, reddish. Thoracic dorsum reddish-brown, sides and pectus yellow, mesepisternal stripes as above, but dark metallic-green, mesepimeral stripe broken into the two spots, dark metallic-green; pectoral markings blackish as above, except that the pair of metasternal spots are elongated and fused anteriorly and extend forward as a blackish line into the mid-ventral groove.

Dorsum of abdominal segments darker, retaining the metallic-bluish reflection, except on the apical fifth or sixth, where it is replaced by metallic-green. A narrow, transverse, basal, mid-dorsally interrupted, pale ring on 3–7.

Superior abdominal appendages longer than 10, not as long as 9; blackish-brown, curved toward each other in their distal halves. In dorsal view the inner edge of each appendage bears at one-third the appendage-length an acute tooth directed caudad, followed by a lamina with an almost straight non-denticulated margin for about one-fifth of the length of the appendage, this lamina terminating almost at a right angle to the appendage and succeeded by a concavity, and this by a small (sometimes double) tooth at seven-tenths of the appendage-length, apex rounded. In profile view the proximal two-thirds are almost straight, the distal third curved downward.

Inferior appendages nine-tenths as long as the superiors, pale brown, almost straight, curved slightly toward each other, very slightly enlarged before the apex in dorsal view; in profile view the distal three-fifths much more slender than the proximal two-fifths.

Legs pale blue or yellow, femora with a superior and an inferior longitudinal black line, tibiæ with an inferior longitudinal black line, tarsi black. Pterostigma blackish brown.

♂ (*Oldest seen*). Generally blackish, except the blue and yellow parts of the head as described for the preceding stage, the pectus (which remains yellow, although the metasternal streaks near the latero-ventral carinæ are elongated anteriorly and unite with the black line filling the mid-ventral groove), the dorsum of abdominal segments 2–5, which show a metallic-green reflection throughout, the ventral margins of the tergites of 1–7 which are yellow, most of the inferior surfaces of the femora and the superior surfaces of the tibiæ, which remain pale blue or yellow; some pruinosity on the prothorax, inferior parts of the mesepimeron and metapleuron, and on abdominal segments, 1, 8–10; the metallic-green mesepisternal and mesepimeral stripes are faintly visible amidst the surrounding black. Pterostigma almost black.

In all the above stages, the pterostigma surmounts two cells, its distal side is less oblique than the proximal; 8–10 postnodals on the front wings, 8–9 on the hind.

Abdomen 26.5–27; hind wing 17–18; costal edge of stigma, front wing, 1.1 mm.

♀ unknown.

Habitat.— Cuba: 1 ♂, probably by Poey, collector's number $\frac{104}{29}$, with label "L. scalaris" in de Selys' hand, the young stage above described; 1 ♂ by Gundlach, 1866, the older stage described, type of the species. Museum of Comparative Zoölogy.

Porto Rico: Mayaguez, by O. W. Barrett, January, 1 ♂, oldest stage described. Collection of P. P. Calvert.

Hagen in his list of Cuban Odonata of 1867 (see *ante*, p. 93), writes "*Lestes scalaris* Hagen. July and August, flying over ponds."

21. **Lestes bipupillatus** sp. nov.

(Plate I, fig. 15; Plate II, figs. 21, 22.)

♂. Metallic-green or bluish-green except the following: genæ below the level of the frons, rhinarium, labrum, external faces of the mandibles, sides inferiorly of abdominal segments 2–7,[10] a narrow, transverse, basal, mid-dorsally interrupted ring on 3–7,[10] a similar apical ring on 2–4 or 6,[10] *pale blue*; labium cream-colored; nasus and sterna of 3–7 black; rear of head, prothorax, a mid-dorsal thoracic stripe about .5 mm. wide, a mesepisternal stripe slightly narrower and immediately bordering the humeral suture, sides of thorax, pectus, abdominal segments 1, 8–10, blackish and pruinose; legs yellowish, femora with two longitudinal lines, tibiæ inferiorly and tarsi, black.

Superior appendages longer than 10, not as long as 9, black, curved toward each other in their posterior halves; in dorsal view, the inner margin of each bears an acute posteriorly-directed tooth in the first fourth, followed in the second fourth by a convexity, the edge of which is very minutely denticulated, and a much less marked convexity in the third fourth, apex of the appendage rounded; in profile, the proximal two-thirds of the appendage is straight, the distal third slightly bent downward.

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[10] Some or all of these abdominal markings may be yellow.

Inferior appendages black, as long as the superiors, in profile each is thick at the base, rapidly contracting to one-third length, whence the remainder is slender and almost straight until the distal fifth, which is curved upward toward the superior; in dorsal or ventral view the basal third is much wider than the remainder, which latter very gradually tapers distally, the extreme apex being very slightly enlarged and rounded.

Wings almost clear; stigma almost black, or dark brown surmounting two cells, or more, or slightly less, proximal and distal edges parallel, paler; 9–11 postnodals on the front wing, 8–10 on the hind.

♀. Differs from the male as follows: rear of the head in most of the examples obscure and more or less pruinose, but apparently originally yellow in young stages; prothorax pale brown with a central and a lateral (blue?) spot, later with a pair of metallic-green dorsal spots; thoracic dorsum pale brown, a metallic-green mesipisternal stripe attaining the anterior mesothoracic margin below and to, or not quite to, the antealar sinus above, slightly narrower in its middle, where it is about .25 mm. wide and distant from the mid-dorsal carina by its own width, nearer to the carina at its ends; sides of the thorax yellowish, especially below, a mesepimeral metallic-green stripe half as wide, or less, as the mesepisternal stripe, not reaching to the antealar sinus or the mesinfraepisternum; pectus yellowish, an elliptical black metepimeral spot on the superior side of the anterior end of the latero-ventral metathoracic carina; in one female all but the hind fourth of the mid-ventral metasternal groove is filled with a black stripe; abdominal segment 1, in earlier stages, apparently metallic-green on dorsum, its sides and a mid-dorsal basal spot yellow; 8–10 obscure dark brown, becoming pruinose later, their sides yellowish; abdominal appendages half as long as 10, brown becoming black; genital valves very minutely denticulated, their "palps" reaching back to the level of the tips of the appendages, or slightly less; 8–11 postnodals on the hind wing.

Abdomen ♂ 24–29, ♀ 23–27; hind wing ♂ 16–19, ♀ 16.5–19; costal edge of stigma, front wing ♂♀ 1.1–1.25 mm.

Habitat. — BRAZIL: Chapada, by H. H. Smith; 13 ♂ and parts of

12 others, 6 ♀ and parts of 3? others, collector's number 140; 4 ♂ and parts of 3 others, collector's number 86. Carnegie Museum, Pittsburgh.

All the males are more or less pruinose and consequently mature. One or two of them give hints, that, when immature, their coloring is nearly the same as that described above for the females.

The specific name proposed refers to the pectoral color-pattern.

22. **Lestes spumarius** Selys.

Habitat. — Cuba: 2 ♂; Museum of Comparative Zoölogy, Cambridge, Mass.

One of these males, numbered $\frac{117}{31}$, perhaps by Poey, bears a label "L. spumaria? ♀" in Selys' hand; it has 10 postnodals on all the wings and is smaller than the type.

23. **Lestes mediorufus** sp. nov.

(Plate I, fig. 10; plate II, figs. 23, 24.)

♂. *Younger.* — Dorsal surface of head dull blackish-brown; rhinarium, labrum, external faces of mandibles, genæ below level of frons, pale blue; labium and rear of head yellow.

Prothorax brownish above, pale green on each side.

Thorax pale greenish; a mid-dorsal reddish band about 1.0 mm. wide; a short black line on the upper end of the humeral suture; a reddish-brown stripe, of irregular width of .1–.2 mm., on the lower two-thirds of the mesepimeron; a black line on the upper third of the obsolete first lateral suture, terminating inferiorly in a round spot. Metapleuron lightly pruinose, except at the upper end of metepisternum; pectus yellowish, an anterior metepimeral black stripe, .6 mm. long, above the anterior end of the latero-ventral carina, and a wider metasternal black stripe, 1.2 mm. long, close to and parallel to the same carina, neither of these stripes confluent with each other, nor with their fellows of the opposite side.

Dorsum of abdominal segments 1–5 dark metallic-green, becoming brown on 6–10; a fine pale mid-dorsal line on 2–6 or 7, sides of 1–6 or 7 inferiorly, a narrow transverse basal mid-dorsally interrupted ring on 3–6 or 7, pale blue.

Superior appendages longer than 10, not as long as 9, curved toward each other in the apical third, pale brown, darker at the tips. In dorsal view, the inner edge of each bears at one-fifth length a backwardly-directed spine-like tooth followed after a slight interval[11] by a lamina, the free edge of which is concave and spinulose, and ends at about two-thirds the appendage-length in a second spine-like tooth, longer and more acute than that near the base, beyond which the appendage is moderately slender with a blunt apex; middle third of the outer edge of the appendage denticulate. In profile view the upper edge of the appendage is slightly concave, or almost straight, for the proximal two-thirds, curved downward for the apical third; the basal tooth and lamina of the inner margin are visible on the lower edge, apex truncated.

Inferior appendages in dorsal view reaching to the apex of the second, more acute tooth of the superiors; pale brown, abruptly narrowed on the inner edge at half-length; distal half as wide as proximal, of uniform width, or slightly enlarged in terminal fourth; apex rounded, with pale hairs. In profile view they rapidly taper to half length; distal half slender, directed upward.

Legs yellow, femora with a superior and an inferior longitudinal line, tibiæ with an inferior longitudinal line and the tarsi blackish.

Wings almost clear, stigma surmounting two cells or a little more, brown to dark brown, proximal and distal edges parallel, paler; 10–14 postnodals on the front wings, 8–11 on the hind.

Older. — A blackish line bounding each side of the reddish mid-dorsal thoracic stripe, beginning one-third of the way from the anterior mesothoracic margin, and ending at five-sixths of the way; a narrow black stripe along each side of the mid-dorsal thoracic carina, but leaving the carina itself pale, mesepimeral stripe blackish. (Chapada, 1♂, abdomen 26.5; hind wing 16; costal edge of stigma, front wing, 1.2 mm.)

Oldest stage seen. — Prothorax blackish dorsally, with a pair of arcuate pale green stripes on the middle lobe, front lobe pruinose; each of the blackish lines bounding the reddish mid-dorsal stripe of the preceding stage widened to a stripe .3 mm. wide at mid-height, where it is distant from the mid-dorsal carina by nearly .2 mm., not reaching the anterior mesothoracic margin below, nor the antealar sinus above; area between the two black stripes more greenish than reddish; black mesepimeral stripe continued down upon the mesinfraepisternum, metasternal black stripe widened so as to reach almost to the mid-ventral groove (S. Paulo, 1 ♂, abdomen 26, hind wing 17; costal edge of stigma, front wing, 1.25 mm.).

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[11] In one male referable to this stage there is no interval and the basal tooth appears to be fused with and forms the beginning of the lamina.

♀. Colored like the younger males described above, except as follows: No black lines on the upper ends of the humeral and first lateral sutures, dorsum of abdominal segments 1–10 pale brown, sides of 1–10 inferiorly and a narrow transverse basal ring on 3–7 pale green or blue. Abdominal appendages not quite as long as 10, straight, tapering, pale yellow. Genital valves minutely denticulated, their "palps" reaching backward nearly to the level of the apices of the appendages.

Dimensions of the younger males and the female: Abdomen ♂ 28.5–29.5, ♀ 28; hind wing ♂ 18–19, ♀ 19; costal edge of stigma, front wing, 1.4 mm.

Habitat. — BRAZIL: São Paulo, September 14, 1900, by A. Hempel, 5 ♂, 1 ♀, collector's number 302. Academy of Natural Sciences of Philadelphia. (Type.)

Chapada by H. H. Smith, 1 ♂, no number. Carnegie Museum, Pittsburgh.

Four of the São Paulo males are those above described as "younger." It will be noted that they are larger than the fifth (oldest) male from the same locality and the Chapada male.

24. **Lestes paulistus** sp. nov.

(PLATE I, FIG. 14; PLATE II, FIGS. 25, 26.)

♂. Dorsal surface of head blackish-brown, a triangular pale blue spot postero-laterad to each lateral ocellus, frons and nasus slate-colored; rhinarium, labrum, external faces of mandibles and genæ below the level of the frons pale blue; labium and rear of head cream-colored.

Prothorax blue, a longitudinal blackish stripe on each side. Thorax pale bluish. Each mesepisternum with a metallic-green stripe 1.5 mm. wide in its lower half, above which it becomes a mere line, again enlarging on its outer (lateral) side in the upper third of the sclerite into a large spot, .5 mm. in width, not reaching the antealar sinus; in its lower half this stripe is distant from the mid-dorsal carina by .3 mm., near its upper end by .2 mm. A blackish line on the upper end of the humeral suture. Mesepimeron with two elongated blackish spots having some metallic-green reflection, one above the other, the upper larger. Pectus somewhat pruinose; a slightly elongated black anterior metepimeral spot on the anterior end of the latero-ventral carina, and a pair of small round metasternal spots near the hind end of the mid-ventral groove.

Dorsum of abdominal segments 2–4 dark metallic-green, of 5–10 blackish-brown, 9 pruinose; most of 1 (except a basal dorsal metallic-green spot), sides of 2–7 inferiorly, a narrow transverse basal ring on 3–6, and a fine mid-dorsal longitudinal line on 2–4, pale blue.

Superior abdominal appendages longer than 10, not as long as 9, curved toward each other in their apical halves, black. In dorsal view the inner margin bears an acute tooth, directed caudad, at one-fourth length, followed by a distinct interval, beyond which the inner margin again enlarges into a lamina with a straight minutely denticulated edge terminating without any distinct tooth where the appendage contracts to its narrower terminal two-fifths, apex truncated and rounded. In profile view the appendage is nearly straight in its proximal two-thirds, curved downward in its distal third.

Inferior appendages paler brown; in dorsal or ventral view barely reaching to the hind end of the lamina of the superiors; abruptly narrowed on the inner (mesial) side of each; distal half half as wide as the proximal half, of uniform width, moderately hairy. In profile view the inferiors taper less rapidly than in some of the other species here described, so that the contrast between proximal and distal halves is less marked.

Legs pale yellowish, femora with two superior and inferior longitudinal dark lines, tibiæ inferiorly and tarsi black.

Wings almost clear, stigma surmounting two cells or less, with a paler line just inside the margins (except the posterior), proximal and distal edges almost parallel, 10–11 postnodals on the front wing, 9 on the hind. Dimensions of the type: abdomen 28.5; hind wing 18; costal edge of stigma, front wing, 1 mm.

Variations. — A Cuyabá male lacks the pale blue spots near the lateral ocelli, frons and nasus darker, some metallic-green reflection on the top of the head; rear of the head, much of the prothorax, and of the under parts of the thorax pruinose.

In all of the three specimens other than the type, the metallic-green mesepisternal stripe, instead of contracting into a line just above its middle, remains nearly as wide as in its lower half, but widens at its upper end to the dimension above given; it remains at the same distance from the mid-dorsal carina, but tends to become margined with black in the oldest male at hand (that from Cuyabá the head of which is described above); the upper of the two mesepimeral spots is pronouncedly metallic-green and longer, its upper end reaching to the humeral suture, although not quite attaining the antealar sinus (connected with the lower mesepimeral spot in the oldest male from Cuyabá); metallic-green of the abdominal dorsum reaching back to segment 7 so far as the abdomen is present, 8 also showing some pruinosity, transverse basal ring present also on 7; 8–10 postnodals on the front wing, 9–10 on the hind; abdomen 27 mm.; hind wing 17–18 mm.

Habitat. — BRAZIL: São Paulo, September 14, 1900, by A. Hempel, 1 ♂, no number (type). Academy of Natural Sciences of Philadelphia.

Cachoeira, by H. H. Smith, 1 ♂, collector's number 39, lacks the head. Carnegie Museum, Pittsburgh.

Cuyabá, by H. H. Smith, 2 ♂, no number, one lacking the abdomen, the other lacking the head and abdominal segments 7–10. Carnegie Museum, Pittsburgh.

25. **Lestes pictus** Hagen.

(PLATE I, FIG. 11; PLATE II, FIGS. 27, 28.)

Lestes picta Hagen, Bull. Acad. Roy. Belg. (2), xiii, p. 314, 1862.

The supposed types of Hagen are before me, although the abdomen of the male measures 36 instead of 34 mm. The "raie humérale orangée" is strictly mesepimeral and in the female, as in the male, is "suivie d'un espace brun jusqu'à la première suture latérale." The pectus may have been bluish or yellowish; there is an elongated isolated metepimeral black spot on the anterior end of the latero-ventral carina, and a smaller blackish metasternal spot farther posterior and close to the carina; mid-ventral groove black.

A female from Chapada may belong to this species; the differences from the type female which it shows are at least too slight to refer it to another species in the absence of any male with which it might be conspecific. A comparison of the type female follows, the parentheses enclosing statements concerning the type: abdomen 30 (32) mm.; hind wing 22 (23) mm.; costal edge of stigma front wing 1.3 (1.5) mm.; width of head 3.4 (3.7) mm.; maximum width of thorax 2.7 (3.0) mm.; sides of the thorax pale bluish (yellow); dorsum of abdominal segments 2–6 dark brown without metallic-green reflection (darker, with a slight metallic-green reflection); 10–11 (12–13) postnodals on the front wings, 10 (12) on the hind.

In both females the blackish mesepisternal stripe — the "raie noire presque contre la raie bleue juxta-humérale " of the original description — is of almost equal width at mid-height, .28 mm. in the type, .24 mm. in that from Chapada, and is situated at the same distance from the mid-dorsal carina, *i. e.*, .4 mm. at mid-height ; abdominal segments 8–10 brown with a mid-dorsal longitudinal green (not "brune ") stripe ; the sides of 8 for the entire length of the segment and the middle two-fourths of the sides of 9, pale green.

Habitat. — BRAZIL : no definite locality, 1 ♂, 1 ♀ each with two labels in Hagen's handwriting "Brazil Fischer " and "L. picta." Museum of Comparative Zoölogy, Cambridge. Presumed types.

Chapada, by H. H. Smith, 1 ♀, collector's number 9. Carnegie Museum, Pittsburgh.

26. **Lestes tricolor** Erichson.

(PLATE I, FIG. 9 ; PLATE II, FIGS. 29, 30.)

Habitat. — BRAZIL : Bahia [?] 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

27. **Lestes tenuatus** Rambur.

(PLATE I, FIG. 12.)

Lestes tenuatus Calvert, Biol. Centr.-Amer. Neurop., pp. 48, 50, 352, 1901, 1907.

Habitat. — COLOMBIA : Don Diego in Dept. Magdalena, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

28. **Lestes dichrostigma** sp. nov.

(PLATE I, FIG. 8 ; PLATE II, FIGS. 31, 32.)

♂. Upper surface of head dull brownish, rhinarium, labrum, outer faces of mandibles, genæ below the level of the frons pale blue ; rear of head and labium yellow.

Prothorax violaceous, yellowish on each side of the middle lobe.

Thoracic dorsum violaceous, each mesepisternum with a slender metallic-green stripe .1–.2 mm. wide at mid-height, slightly wider above where it does not quite reach the antealar sinus, attaining the anterior mesothoracic margin below, parallel to and distant from the mid-dorsal carina by two to three times its own width. Mesepimeron pale violaceous-brown having on the posterior margin a dark brown stripe showing some metallic-green reflection, .3 mm. wide, not reaching antealar sinus, or mesinfraepisternum, this last with a dark brown spot. Sides and sternum of metathorax pale yellow, perhaps tending to pale bluish in life, upper end of metepisternum dark, blackish in older examples, the dark color extending farther down on the anterior and posterior margins than on the disk; a black anterior metepimeral stripe uniting with its fellow of the opposite side on the mid-ventral line; a black metasternal stripe, 1.25 mm. long, parallel to and almost contiguous with each latero-ventral carina, reaching farther forward and backward than the level of the hind end of the black metepimeral stripe, but not confluent with it. Mid-ventral thoracic groove blackish, especially between the bases of the legs, and a small elongated black metasternal spot on each side of its hind end.

Dorsum of abdominal segments 1–7 bronzy brown; basal dorsal portion of 1, a fine mid-dorsal longitudinal line on 2–4, a narrow transverse basal ring on 3–7 (usually interrupted mid-dorsally), a similar narrower apical ring on 3–6, sides of 1–6 or 7 inferiorly (except on the posterior sixth of 3–6) yellowish. Dorsum of 8–10 obscure, sides paler. Segment 7 different from all the others in having a coat of pale hairs reaching from one-fourth to five-sixths of the length of the segment, chiefly on the dorsal side, the hairs being one-third to one-half as long as the segment is thick.

Superior abdominal appendages twice as long as 10, longer than 9, not as long as 8, straight in the proximal half or three-fifths, curved toward each other and overlapping in the remaining half or two-fifths. In dorsal view there is on the inner edge a large blunt triangular tooth occupying the proximal half of the appendage, proximal edge of the tooth a little shorter than the distal edge, the latter terminating in a small prominence, which at its hind end forms almost a right angle with the appendage; the remainder of the appendage at first slender, then enlarging slightly, denticulated externally, and terminating in a rounded somewhat hairy apex. In profile view the upper margin in the proximal three-fifths is almost straight, distal two-fifths bent downward, tooth of the basal half forming a pronounced inferior convexity followed by a tubercle with very little interval between; at about four-fifths the appendage-length is an elongated inferior tubercle.

Inferior appendages about one-third as long as the superiors, reaching to slightly beyond the level of the apex of their basal tooth, abruptly narrowed on the inner edge at half their own length, basal half three to four times wider than the apical half, which latter is inclined toward its fellow of the opposite side, but not enlarged at tip. In profile view the inferiors taper rapidly to half their length, apical half very slender, straight.

Legs yellow, femora with two dark longitudinal lines, one inferior, the other superior, a dark inferior line on the first and second tibiæ.

Wings almost clear, stigma surmounting two cells, distal edge slightly more oblique than the proximal edge, in younger examples bicolored — brown with the distal third obliquely yellowish — in older individuals entirely brown; 10–13 postnodals on the front wings, 9–12 on the hind.

♀. Differs from the male as follows: no coat of long pale hairs on 7; 8–10 pale yellow or green; a brown stripe on each side of dorsum, this stripe extending down on the sides at the apex of 9 and of 10; a darker inferior line on the third tibiæ also; abdominal appendages not quite as long as 10 is dorsally, yellowish at base, brownish beyond, straight; margin of genital valve minutely denticulated, "palp" reaching almost to level of tips of abdominal appendages; pterostigma bicolored, as described above for younger males.

Abdomen: ♂ 35–36.5, ♀ 31–34; hind wing: ♂♀ 21–21.5; costal edge of stigma, front wing, ♂♀ 1.4 mm.

Habitat. — BRAZIL: São Paulo, September 14, 1900, 4 ♂, 2 ♀, by A. Hempel, collector's number 301, Academy of Natural Sciences of Philadelphia (type).

Chapada, by H. H. Smith, 1 ♂ No. 183. Carnegie Museum, Pittsburgh.

The Chapada male is much discolored, but the appendages and the pectoral pattern leave no doubt of its belonging to this species.

29. **Lestes undulatus** Say.

(PLATE I, FIG. 16; PLATE II, FIGS. 33, 34.)

Habitat. — BRAZIL: Rio Grande do Sul, by H. H. Smith, 1 ♂ (segments 7–10 lacking). Carnegie Museum, Pittsburgh.

URUGUAY: Montevideo, 1 ♀ ex Mus. Berol., Museum of Comparative Zoölogy, Cambridge, Mass.

CHILE: Baños de Cauquenes, C. E. Reed, 1 ♀. U. S. National Museum. Penco, 7 ♂ 8 ♀, Tolca, 1 ♂ 1 ♀, Concepcion, 1 ♂ 2 ♀, Lota, all in January, 1905, by C. E. Reed. Academy of Natural Sciences of Philadelphia.

30. **Lestes quadristriatus,** sp. nov.

(PLATE I, FIG. 13; PLATE II, FIGS. 35, 36.)

♂. Vertex, frons, and nasus blackish-brown; rhinarium, genæ below the level of the frons, labrum, and external faces of the mandibles pale bluish-green; labium cream-colored; rear of the head mostly pale, but somewhat discolored.

Anterior prothoracic lobe and sides of the median lobe bluish; median lobe reddish dorsally with some dark central markings.

Thoracic dorsum faded, probably bluish in life; on each side of the mid-dorsal carina is a straight, dark, bronze-green stripe about .3 mm. wide at mid-height, narrower at its lower or anterior end, which attains the anterior mesothoracic margin, its upper end not quite reaching the antealar sinus. Each of these stripes is parallel to the mid-dorsal carina, and distant from it at mid-height by about half its own width. Sides of the thorax and pectus pale bluish; along the posterior margin of the mesepimeron is a black, slightly wavy stripe, slightly wider than the bronze-green mesepisternal stripe above described, not reaching to the wing-base above nor to the mesinfraepisternum below. Lower end of the mesepimeron and corresponding part of mesinfraepisternum brownish, becoming black in part on the last-named sclerite. The following marks on the pectus are black: the mid-ventral metasternal suture, an oblique anterior metepimeral line, which unites, or almost unites, anteriorly with the mid-ventral suture, and a metasternal stripe on each side, parallel and close to the lateral carina, unconnected with, and not reaching as far forward as, the preceding oblique line.

Abdominal segment 1 pale green; dorsum of 2–8 blackish-bronze, which extends down on the sides in the posterior half of 2, posterior sixth of 3–5, or more of 6–8; remainder of the sides of 2–8, a narrow, transverse, basal, mid-dorsally interrupted ring on 3–5 or 6, a mid-dorsal longitudinal line or stripe on 2, pale green; 9 and 10 obscure, pruinose.

Superior abdominal appendages longer than 10, not quite as long as 9, brown at base, darker in their remaining four-fifths; in dorsal view curved toward each other in the apical third; on the inner lower margin of each, in the second fifth of the appendage length is a rounded tooth, or convex projection, followed by a very short, nearly straight edge, succeeded by a second convexity, shorter and less pronounced than the first, and bearing about four acute denticulations and terminating at nearly two-thirds of the appendage length; in profile the two convexities above described are also visible while the apex is bent downward so strongly as to form almost a right angle with the superior margin, the extreme inferior tip being moderately acute. Inferior appendages lost.

Legs pale; femora superiorly with two longitudinal dark stripes; tibiæ inferiorly, and most of the tarsi dark.

Wings slightly cloudy, stigma almost black, surmounting two cells (or slightly more or less), distal edge more oblique than the proximal, 12–14 postnodals on the front wings, 12 on the hind.

♀. Differs from the male as follows: rear of head distinctly yellow; bronze-green mesepisternal stripe only one-third as wide as that of the ♂ and separated from the mid-dorsal carina by a greater interval, *i. e.*, twice its own width; sides of the thorax and pectus more yellowish; black mesepimeral stripe shorter (half, or less than half, as long as the sclerite) and narrower (half, or less than half, as wide as the sclerite); black absent from the mesinfraepisternum in one ♀; less blackish-bronze on abdominal segments 2–5 in that it does not extend on the sides before the apex of each (segments 6–10 lost); 11–14 postnodals on the front wing, 10–12 on the hind.

Abdomen ♂ 34 mm. (segs. 1–5, 20 mm.), ♀ (segs. 1–5, 19 mm.); hind wing ♂ 20, ♀ 20.5–22 mm.; costal edge of stigma, front wing, 1.3–1.5 mm.

Habitat. — BRAZIL: Chapada, by H. H. Smith. The type, a male, collector's number 141, has lost the head. One male and two females, collector's number 84, have lost abdominal segments 6–10 or 2–10 (1 ♀) but appear to be of the same species. All four specimens in the Carnegie Museum, Pittsburgh.

31. **Mecistogaster ornatus** Rambur.

Mecistogaster ornatus Calvert, Biol. Centr.-Amer. Neurop., pp. 55, 353, 1901, 1907.

Habitat. — COLOMBIA: Don Diego, 2 ♀; Bonda, July, 1 ♀, September, 1 ♀, November, 1 ♀, December, 1 ♀; Don Amo, November, 1 ♂; Onaca, December, 2 ♂, 1 ♀; Valparaiso, December, 1 ♂; all in Dept. Magdalena, by H. H. Smith. Carnegie Museum, Pittsburgh.

These localities give a vertical distribution for this species of from 100 to 4,500 feet.

32. **Mecistogaster amalia** Burmeister.

Mecistogaster amalia, Calvert, Biol. Centr.-Amer. Neurop., p. 354, 1907.

Habitat. — BRAZIL: Rio de Janeiro, by H. H. Smith, November, 1 ♀, December, 1 ♀. Carnegie Museum, Pittsburgh.

PARAGUAY: Sapucay, by W. T. Foster, January, 1900 and 1901, 1 ♂ 3 ♀, February, 1900, 3 ♂, March, 1900, 6 ♂. U. S. National Museum.

33. **Megapodagrion setigerum.**

Megapodagrion setigerum Selys, Mem. Couron. Acad. Belg., xxxviii, p. 42, 1886.

A male from Chulumani in Bolivia, taken January 5, 1899, by W. J. Gerhard (Academy of Natural Sciences of Philadelphia) is smaller than the types from Intaj, Ecuador, having the abdomen 30 mm., hind wing 24.5 mm.; there is a supplementary sector between M_2 and R_s (nodal and subnodal sectors), not between R_s and M_3 (subnodal and median sectors) as the description has it: in this respect this male agrees with *M. nebulosum* Selys, if there has been no error in the description of *setigerum*. Nineteen postnodals on the front wings. Head marked as in *M. nebulosum*. Those parts of the prothorax and thorax, described as "jaunâtre pâle" in *setigerum*, are pale blue; dorsum of abdominal segment 1 pale blue, its sides as well as those of 2–4 inferiorly pale yellow.

34. **Megapodagrion nebulosum** Selys.

Habitat. — Peru: Piches and Perenes valleys, 2,000–3,000 feet, Soc. Geog. de Lima, 1 ♂. U. S. National Museum.

Bolivia: Chulumani, January 5, 1899, 1 ♂; near Coroico, June 3, 1899, 1 ♂; both by W. J. Gerhard. Academy of Natural Sciences of Philadelphia.

The male from near Coroico has the abdomen 33 mm. long, hind wing 27 mm., 19–20 postnodals on the front wing. The corresponding figures for the Chulumani male are 31, 25, 16–18, and for that from Peru, ?, 26, 17–18.

Genus Heteragrion.

i. *Males with the inferior abdominal appendages small, but distinctly developed.*

35. **Heteragrion æquatoriale.**

(Plate III, fig. 37.)

Heteragrion æquatoriale Selys, Mem. Couron. Acad. Belg., xxxviii, p. 63, 1886.

Habitat — Peru: Piches and Perene valleys, 2,000–3,000 feet, 1 ♂, 1 ♀, from Soc. Geog. de Lima. U. S. National Museum.

♂. This male is very large. Even without the second segment (which has been lost) the abdomen measures 48 mm. in length, the hind wing 29 mm., so that the latter organs *would* "atteignent le 6e segment";

there is but one entire cell and a small part of another between the quadrilateral and the level of the vein descending from the nodus on the left hind wing; the stigma surmounts the equivalent of two cells on the left wings, the front wings have 18 postnodals, the maximum width of the hind wings is 4 mm. De Selys' description of the thorax would appear to be slightly incorrect, as "seconde suture latérale" is the same as the "suture latérale médiane" and ought probably to have been "première suture latérale"; so altered, the present male agrees with the description; the tooth of the superior appendages is not as acute as in *H. majus*.

♀. The specimen is teneral, pterostigma pale yellow, surmounting the equivalent of two cells or more, maximum width of hind wings 5 mm.; abdominal segments 4–6 are lost, genital valves 1 mm. long, exclusive of the "palps": hind wing 30.5 mm.

36. **Heteragrion angustipenne** Selys.

(PLATE III, FIGS. 42, 43.)

Heteragrion angustipenne Selys, Mem. Couron. Acad. Belg., xxxviii, p. 64, 1886.

Habitat. — PERU: Cumbase, 1 ♂. Collection of P. P. Calvert *ex coll.* R. Martin.

Smaller than the type, abdomen 42, hind wing 24.5 mm., maximum width of front or hind wing 3.2 mm.; 16 postnodals on the front wing; otherwise agreeing well with the description, which does not include the last three segments or the appendages, wherefore the following: 8 pale yellow, some brown on each side at base; 9 and 10 blackish-brown on dorsum, sides inferiorly and ventral surface pale (yellowish?). Superior appendages twice as long as 10, as long as 9, blackish, almost identical in shape with those of *H. inca*, n. sp. (*q. v.*). Inferior appendages very small, pale throughout, their slender apices directed upward.

37. **Heteragrion inca** sp. nov.

(PLATE III, FIG. 38.)

♂. Dorsal surface of the head black from the median ocellus back to the posterior margin, frons and nasus golden yellow; first two antennal joints, genæ, lips, and rear of head pale yellow, but not golden; an elongate black spot between each antenna-base and the adjoining eye.

Prothorax obscure yellowish with a mid-dorsal longitudinal black stripe expanding on the hind lobe, but leaving the margins yellow.

Remainder of thorax pale (blue?), but with blackish-brown predominating on the dorsum, so that there remains of the pale color only a narrow line (bordering the .4–.5 mm. wide mid-dorsal brown stripe on each side, and in front of the antealar sinus) and the posterior mesepisternal margin to a width of .3 mm. Mesepimeron and metepisternum each with an ill-defined median brownish stripe from the level of the metastigma upward.

Abdominal segment 1 pale (yellow?), dorsum of 2–7 blackish-brown, 2–5 with a fine mid-dorsal longitudinal yellow line, 3–7 with a transverse basal yellow ring and the posterior sixth with a transverse black ring; the blackish-brown of the dorsum of 4–7 extends farther down on the sides in the second and third sixths of the length of those segments than in the fourth and fifth sixths, indeed completely encircles these segments in the second sixth, so that in ventral view each of segments 4–7 show two yellow and two brown transverse areas alternating to make four in all; 8 pale yellow with a mid-dorsal longitudinal blackish band narrowing posteriorly to a line at the hind end; 9 and 10 with the dorsum blackish-brown, sides and under surface yellow.

Superior abdominal appendages twice as long as 10, not so long as 9, forcipate, base not swollen, inner margin with a slight and gradual convexity at one-fourth length and a tooth at three-fifths length, apex of tooth angular, not rounded, but not acute; upper surface of the appendage with a slight obliquely-transverse ridge above this tooth, and with a longitudinal groove distal to this ridge almost to the blunt and rounded apex of the appendage; outer margin of the appendage with 6–7 spines in the distal half; outer margins of the appendages blackish, inner margins pale brown.

Inferior appendages pale yellow, extremely short, their slender acute apices directed upward.

Legs obscure (bluish?) with two dark transverse bands on the femora and the inferior surfaces of the tibiæ blackish.

Wings with the cubito-anal cross-vein (= basal postcostal of de Selys) proximal to the level of the arculus by a distance subequal to the total length of the arculus, anal vein (here = inferior sector of the triangle of de Selys) separating from the hind margin of the wing between the levels of the cubito-anal cross-vein and arculus, two antenodal cells distal to the quadrilateral; stigma dark brown with a pale marginal line just within the enclosing veins, surmounting more than two cells or their equivalent; front wings with 18–19 postnodals, hind-wings with 16 postnodals.

♀. Differs from the male as follows: Dorsal surface of the head pale reddish-brown, a transverse black stripe on the posterior margin; a transverse black line beginning behind each lateral ocellus, running toward the eye but forking before reaching it; the elongate black spot between each antenna-base and the adjoining eye described for the male is present, but larger, and in the same transverse line with these spots is a transverse black stripe between the two antennæ, the three thus forming a transverse black stripe from eye to eye in front of the median ocellus, but interrupted by each antenna; frons, nasus, genæ, lips, and rear of head yellow, free margin of, and a mid-basal spot on, the nasus black; mid-dorsal longitudinal black stripe absent from the prothorax, but the spot on the hind lobe almost as large as in the male; remainder of thorax perhaps pale yellow instead of blue; dorsum marked as in the male, but with a paler brown; mesepimeral and metepisternal brown stripes on the contrary darker and more sharply defined than in the male; brown on the abdominal dorsum paler, posterior sixth of 6 barely and of 7 not at all darker than the remainder of those segments; 8 with merely a mid-dorsal longitudinal black line; no dark markings on 9 and 10; abdominal appendages longer than 10, half as long as 9, reddish, black at the acute tip; genital valves reaching so far backward as to slightly exceed the level of the apices of the appendages, their inferior margin minutely denticulate; legs pale yellow, femora with a darker superior and a darker inferior longitudinal line or stripe, inferior surfaces of tibiæ darker; wings slightly smoky, distinctly wider, 17 postnodals on the hind pair.

Abdomen ♂ 37, ♀ 35.5; hind wing ♂ 23, ♀ 25.5, its maximum width ♂ 3.7, ♀ 5; costal edge of stigma, front wing, ♂ 1.1, ♀ 1.3, posterior edge of same ♂ 1.6, ♀ 1.8 mm. Genital valves, ♀ 3 mm. long.

Habitat. — PERU: Iquitos, Staudinger, 1 ♂, 1 ♀. Museum of Comparative Zoölogy.

This pair closely resemble the descriptions of *H. icterops* Selys, but differ therefrom in the longer abdomen of the male (*icterops* 32 mm.), pterostigma surmounting more than two cells (less than two cells in *icterops*), in having no black between the antennæ in the male (in *icterops* male: "entre lesquelles [antennes] le noir du dessus de la tête dessine, devant les ocelles, une double échancrure"), inferior appendages of the male entirely yellow (in *icterops*, "finissant subitement en pointe noire").

From the descriptions of *H. æquatoriale* Selys and *H. angustipenne* Selys, this pair differ by the shorter abdomen of the male, tooth of the superior appendages not acute (acute in *æquatoriale*, not in *angustipenne*), black of the upper surface of the head of the male not advancing to the upper surface of the frons (as it does in *angustipenne*, although not in *æquatoriale*).

The length of the genital valves of the female appears to be unusual in this genus. Hagen had given the manuscript name of *inca* to this species, but published no description, and this name has already been employed in an anatomical paper (Higgins, Proc. Acad. Nat. Sci. Phila., 1901, p. 137, pl. III, fig. 18) when referring to material obtained from the types here and now described (not 2 ♂ as stated, *l. c.*).

38. **Heteragrion flavidorsum** sp. nov.

(PLATE III, FIG. 41.)

♂. Differs from *H. inca* n. sp. (*q. v.*), as follows: hind lobe of prothorax entirely black; pale color of the thorax yellow, the narrow yellow line bordering each side of the mid-dorsal black stripe has disappeared, except at its upper end and in front of the antealar sinus; dorsum of abdominal segment 1 chiefly blackish-brown, the fine mid-dorsal longitudinal yellow line on 3–5 or 6 has expanded on the anterior five-sixths of 3 and on the second to fifth sixths of 4–5 or 6 into a dorsal yellow stripe of almost the full width of the segments, which stripe is bounded laterally by a blackish-brown line, thus separating the dorsal yellow from the ventral yellow; transverse basal yellow rings of 3–7 obscure, apparently interrupted by black mid-dorsally; ventral surface of 7 brown throughout; mid-dorsal longitudinal blackish stripe on 8 confined to the anterior half of the segment; superior appendages as long as 9, tooth on the inner margin situated at two-thirds of the appendage-length; apices of inferior appendages blackish; legs brown, femora yellow inferiorly, tibiæ and tarsi blackish; 17–18 postnodals on the front wing, 16–17 on the hind.

Abdomen 40.5; hind wing 24.5, its maximum width 4.0; costal edge of stigma, front wing, .9, posterior edge of same 1.3 mm.

Habitat.—BOLIVIA: Nine miles from Coroico, May 19, 1899, by W. J. Gerhart, 1 ♂. Academy of Natural Sciences of Philadelphia.

Of the differences given above from *H. inca* those due to an increased area of black might conceivably be the results of age, but no such explanation will account for the wide dorsal yellow stripes of 3–5 or 6.

I had first identified this male as *H. æquatoriale*, but neither the description of that species, nor the male which is referred to it on page 107, give any indications of the lateral blackish line on segments 3–5 or 6 which separates the dorsal yellow from the ventral yellow of those segments; the tooth on the inner margin of the male of *H. inca* is much less acute than in *H. æquatoriale.* Both of these differences may be bridged over when a larger series of specimens is available.

ii. *Males with the inferior abdominal appendages undeveloped.*

39. **Heteragrion triangulare** Hagen.

(Plate III, fig. 39.)

Heteragrion triangulare Hagen, Bull. Acad. Roy. Belg. (2), XIV, p. 32, 1862; Selys, Mem. Couron, Acad. Belg. xxxviii, p. 58, 1886.

A complete male of this species has never been described, and de Selys was uncertain whether the imperfect male which he referred here in 1886 belonged to the species of 1862 or not. A description of specimens which seem to be conspecific with the type female follows.

♂. Pale reddish-brown with the following blackish markings: a band on the labrum (leaving the free margin and a short streak on each side pale; in the youngest male only a central round spot is blackish), the nasus, most of the upper surface of the head from and including the first antennal joint back to the posterior margin (leaving pale-colored a stripe running from each lateral ocellus forward and outward to the eye of the same side, and a shorter transverse isolated streak each side a little posterior to the level of each lateral ocellus much nearer to the eye than to the ocellus), a narrow median perpendicular stripe on the anterior surface of the frons connecting the black of the nasus with the black of the upper surface of the head, front lobe of the prothorax (except for two minute dots), a band in the mid-dorsal groove of the middle lobe confluent with a transversely elongated elliptical spot on the middle of the hind lobe, a mid-dorsal thoracic stripe .4 mm. wide at mid-height, a mesepisternal stripe almost as wide at its upper end as the sclerite but abruptly narrowed on its outer (lateral) side at nearly mid-height to half its former width (this mesepisternal black stripe is completely separated from the black antealer sinus and mid-dorsal stripe by a pale yellowish line, but is confluent at its lower end with some black on the anterior mesothoracic margin with which the mid-dorsal stripe is also confluent), a mesepimeral stripe not reaching the wing-base above, widening inferiorly, subequal in width to the pale area separating it from the black mesepisternal stripe, faint traces of markings on the upper ends of metepisternum and metepimeron, a short oblique streak just above the metastigma in the oldest male, a small bilobed dorsal spot on abdominal segment 1, some indistinct marks on each side of the dorsum of 2, a terminal transverse ring on the posterior sixth of 3–6, the posterior margin of 10, the superior abdominal appendages, a superior and an inferior longitudinal stripe on the femora, the inferior surface of the tibiæ and much of that of the tarsi. Abdominal segments 3–7 have a transverse basal yellow ring between which and the terminal blackish ring (on 3–6) most of the segments are brown dorsally, except for a fine mid-dorsal longitudinal yellow line, although this brown is much paler in the fourth and fifth sixths of 4–6 than in the basal halves of those segments; most of 7 is brown, paler posteriorly, 8–10 brownish-yellow.

Superior abdominal appendages not as long as 9, twice as long as 10, forcipate, apex obtusely rounded, basal fourth swollen, especially inferiorly, but also superiorly and interiorly, inner margin at half-length with a stout tooth obliquely truncated at tip, visible both in dorsal and in profile views, outer margin in the apical third with four spines. Inferior appendages undeveloped.

Pterostigma of the usual shape, dark brown, surmounting two cells or more. Front wings with 18–22 postnodals, 3 (62½ per cent.) or 2 (37½ per cent.) antenodal cells distal to the quadrilateral. Hind wings with 16–19 postnodals, 2 (87½ per cent.) or 3 (12½ per cent.) antenodal cells distal to the quadrilateral. On all the wings the cubito-anal cross-vein (= basal postcostal of de Selys) is close to the arculus, being proximal thereto by less than the total length of the arculus; point of separation of vein A (= postcostal of de Selys) from the hind margin of the wing only slightly distal to the level of the proximal end of the quadrilateral, or at that level, or even slightly proximal thereto.

♀. Dull yellow replacing pale reddish-brown of the male, pale stripes on upper surface of head more extended, those from the lateral ocelli to the eyes confluent in front of the median ocellus, hind lobe of prothorax more produced posteriorly, its central black spot circular, mesepisternal black stripe narrower, its lateral edge ill-defined, a black stripe on each side of the dorsum of abdominal segment 2 for almost its whole length, brown on the anterior five sixths of 3–7 almost black, not paler in the fourth and fifth sixths, a mid-dorsal longitudinal yellow line on 2–9 (not 2–7 as in the original description of 1862), a transverse basal yellow ring on 2–7 (not 2–9 as in the original description); on the sides of 2–8 below the dorsal blackish is a longitudinal yellowish stripe confluent with the transverse basal yellow ring, ending posteriorly at the transverse black ring on 3–7, and below this yellowish stripe is a similar blackish stripe; 9 is brown with an oblique lateral yellow band running from the anterior margin backward and upward so as to be confluent with the posterior end of the mid dorsal longitudinal yellow stripe already mentioned; 10 yellowish, dorsum brown, its entire posterior margin armed with about 14 spinules much longer and stouter than those of any other segment. Appendages longer than 10, very acute, brown. Genital valves yellow, lower margin with curved serrations.

Front wings with 18–20 postnodals, 2 antenodal cells distal to the quadrilateral. Hind wings with 15–16 postnodals, 2 antenodal cells distal to the quadrilateral.

Abdomen ♂ 40, ♀ 32; hind wing ♂ 25–26, ♀ 26–27; costal edge of stigma, front wing ♂ 1–1.1, ♀ 1.2; posterior edge of same stigma ♂ 1.5–1.8, ♀ 1.8–2 mm.

Habitat. — BRAZIL, Chapada, by H. H. Smith, 1 ♂ collector's number 44, 1 ♂ No. 109 (lacks abd. seg. 8–10), 2 ♂ lacking abdomens, 1 ♀ lacking abd. seg. 4–10, 1 ♀ lacking head.

The type (female) of *H. triangulare* was from "Brésil méridionale (Schott). (Mus. de Vienne.)"

40. **Heteragrion aurantiacum** Selys.

(PLATE III, FIG. 40.)

Habitat. — BRAZIL: Rio de Janeiro, by H. H. Smith, 1 ♂ and parts of 3 ♂, November, 2 ♀, December, 1 ♀ and part of one other. Carnegie Museum, Pittsburgh.

PARAGUAY: Sapucay, by W. T. Foster; November, 1899, 4 ♂ (No. 22), December, 1899, 4 ♂ (No. 22), 1 ♀ (No. 58), January, 1900, 1 ♀ (No. 58). U. S. National Museum.

I am not certain whether all these specimens belong here or not, but they agree better with the description of *H. aurantiacum* than with that of any other species. The original description of 1862 does not mention a line, at first brown but black in later life, which appears on the outer side of the yellow line bordering each side of the black mid-dorsal thoracic carina.

Genus PERILESTES.

The presence of one male and of parts of one male and two females from Chapada, by H. H. Smith, in the Carnegie Museum collection, and referable to this genus, has resulted in drawing up the following comparisons.

Males.

	P. fragilis? Hagen (Chapada 2 ♂ as above). (Plate 3, figs. 44, 45, Plate 8, fig. 140.)	*P. cornuta*[12] Selys, Mem. Couron. Acad. Belg. xxxviii, p. 68. 886. (Selys' description.)	"*P. fragilis?*" of Biol. Centr.-Amer. Neurop. p. 409. 1908. (1 ♂ Surubres in Costa Rica). (Plate IV., fig. 64.)
Vein M_{1a} (=ultranodal sector of de Selys) begining	Under, or at the level of the distal edge of the stigma.	3–4 cells proximal to the level of the stigma	1–2 cells proximal to the level of the stigma.
Postnodals, front wing	11–12	14–15	13
Labrum	pale blue	black	pale brown
Nasus	pale blue, black at base	brown	pale brown.
Abdominal segment 2	metallic-green, a mid-dorsal line and sides inferiorly yellow	chiefly yellow ochre with a dorsal black band	(like *cornuta*)
Abdominal segments 3–6 with	no ante-apical yellow ring, but with a narrow basal yellow ring	a broad basal and an anteapical yellow ring	(like *cornuta*)
Superior appendages, in dorsal view, having	at one-third length a lamellate obliquely truncated tooth directed caudad, not forming a right angle with the append-	basal half strongly dilated, flattened, this dilation ending suddenly at a right angle, the angle prolonged inferiorly as an	(damaged and distorted, more like *cornuta*)

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[12] By analogy with *Lestes*, this name should be *cornutus*.

	age nor presenting the appearance of an acute spine in any view, followed by a slight obtuse tooth at nearly one-half the appendage-length, this latter tooth preceded and followed by a concavity, the distal concavity followed by a longer convexity ending at seven-eighths' length, apex moderately acute.	acute spine, terminal half of the appendage enlarged in its middle internally, then a little retracted at the apex, which is hairy	
Legs	yellowish, knees and upper surface of tibiæ brownish or blackish	black, tibiæ externally brown, tarsi red	
Ventral surface of thorax	reddish-yellow, pale green in the center	black	yellow
Length of abdomen in mm.	46	47	48
Length of hind wing in mm.	21	23–25	23

Females.

	P. fragilis ? Hagen, Bull. Acad. Belg. (2) xiv, p. 31, 1862 (Chapada, 2♀ as above)	*P. cornuta* Selys (From Selys' description)	*P. attenuata* Selys, Mem. Couron. Acad. Belg. xxxviii, p. 68, 1886. (From Selys' description)
Hind margin of prothorax	convex, without any horn or process	bearing at the middle a sraight cylindrical, completely erect horn	forming at the middle only a slight tubercle, and not an erect stalk
M_{1a} beginning	from one cell proximal to stigma to under the stigma	[not stated; as in male?]	at level of the vein [= proximal end ?] of the stigma

Postnodals, front wing	14	do.	12
Black ray on second lateral thoracic suture	very narrow		narrow
Pale anteterminal yellow ring on abdominal segments 3–6	very indistinct, almost absent		narrow
Black rings on femora	very indistinct or absent	(feet yellow ; interior of femora and of tibiæ absent)	two
Length of abdomen in mm.	(broken)	40–42	41
Length of hind wing in mm.	21–24		22

It seems fairly certain that the pair which de Selys doubtfully referred to *fragilis* Hagen in 1886, and for which he suggested the alternative name of *cornuta*, are not *fragilis*. It is possible that the Porto Rican male above described may also be *cornuta;* it agrees better therewith than with *fragilis*. Finally *attenuata* Selys may not be specifically distinct from the true *fragilis* Hagen.

Genus ARGIA.

As is to be expected in any considerable collection of Odonata from tropical continental America, large numbers of specimens belonging to this genus are before me, some of them representing species, which seemingly were not described by de Selys. On the other hand, some of the forms which he and Hagen enumerated in 1865 are not to be found among the present material, so far as I can see.

To assist in the identification of members of this difficult genus and to correlate the South American species with those from Mexico and Central America, a synopsis of the principal color characters and of some of the structural features is herewith presented. As far as possible the same expressions and the same letters for indicating the divisions of this key have been employed as were used in the Biologia Centrali-Americana, volume Neuroptera, pages 69–74 and 358–361. One difference must be noted, however. In the 'Biologia,' the black humeral stripe was said to be "forked above" when "a dark mesepimeral stripe is fused with the humeral stripe proper at its lower, but not its upper, end" (*l. c.*, p. 69). It has seemed better, here and now, to apply the expression "forked" to the dark humeral stripe whenever it divides into two diverging branches, one on the humeral suture, the other running up on the mesepimeron.

I repeat the statement of the 'Biologia' that the chief specific characters are furnished by the abdominal appendages of the males and the mesostigmal laminae of the females, although, owing to the difficulty of describing these structures accurately *and briefly*, recourse is had chiefly to figures rather than to words in the attempt to make them known.

KEY TO SOUTH AMERICAN SPECIES OF ARGIA MENTIONED IN THIS ARTICLE.

Males.

I. Total area of dark colors on abdominal segments 3–6 and thoracic dorsum *greater* than the total pale area on the same parts.
  1. Thoracic dorsum not brilliantly metallic.
    A. Labrum pale.
      B. Pale colors on dorsum of 3–6 limited to a transverse basal ring and at most a fine mid-dorsal line; rear of head chiefly black.
        C. Abdominal segment 8 mostly black on dorsum.
          D (not represented).
          DD Abd. segment 9 mostly black on dorsum, anterior half to fourth of its dorsum pale, superior appendages not bifid at tip...*translata.*
        CC. (not represented).
        CCC. Abdominal segments 8 and 9 pale on dorsum.
          a. (not represented).
          aa. Abd. seg. 3 with the basal sixth or less blue, remainder of the dorsum black, 3 antenodal cells on the hind wings.
            b. Inferior appendages bifid, abd. segs. 8 and 9 with an inferior longitudinal black stripe each side. *reclusa.*
      BB. Pale colors on dorsum of 3–6 consisting of a transverse basal ring and a mid-dorsal stripe on some or all of them, tapering posteriorly, 8 mostly blue on dorsum.
        F. Superior appendages distinctly bifid, inner branch much longer than the outer.
          Rear of head black, black humeral stripe not forked. *sordida.*
          Rear of head chiefly pale, black humeral stripe forked in its upper half to third...*fosteri.*
        FF. Superior appendages variously formed, but not distinctly or deeply bifid.
          d. Antenodal cells on the front wing usually more than 3.

Inferior appendages in profile view with the lower branch forming a finger-like tapering process projecting caudad and curved up at tip; 3 antenodal cells on hind wings.

Larger species (abd. 25–29.5, hind wing 20–22 mm.), mesepimeron chiefly pale brown.

Mesepimeron without a black spot on the lowest fourth but with a pale brownish stripe, having some bronzy-green reflection, extending from the lower end of the humeral suture almost to the upper margin of the sclerite...*gerhardi.*

Mesepimeron with a black spot on its lowest fourth as wide as the pale antehumeral stripe, remainder of sclerite pale brown.
gerhardi nigrior.

Smaller species (abd. 23.5, hind wing 16.5 mm.); a black humeral stripe covering nearly all of the mesepimeron, of subuniform width, not forked.
kokama.

Inferior appendages shaped otherwise.

Mid-dorsal pale color on abd. segs. 3–6 a blue stripe, 3 antenodal cells on the hind wing........*oculata.*

Mid-dorsal pale color on 3 a stripe, very short or reduced to a line or absent on 4–6.

Inferior appendages with lower branch (seen in profile) acutely pointed, projecting caudad distinctly beyond the upper branch and beyond the superior appendages, 3 antenodal cells on the hind wings.

Superior appendages strongly declined, reaching beyond the upper branch of the inferiors ....*mollis.*

Superior appendages not or little declined, not reaching caudad as far as the tip of the upper branch of the inferiors.
difficilis.

Inferior appendages with lower branch not acutely pointed, projecting but little beyond the level of the upper branch.

Mesepimeral branch of the forked humeral stripe not reaching to the upper margin of that sclerite, a short black line on the upper end only of the second lateral thoracic suture; 3 antenodal cells on the hind wing.........................*hasemani.*

Mesepimeral branch of the forked humeral stripe reaching to the upper margin of that sclerite, a narrow black stripe on the entire length of the second lateral thoracic suture ; 4 antenodal cells on the hind wing............................*tamoyo.*

dd. Antenodal cells on the front wing usually 3 (but some *mollis* belonging properly under *d.* fall here).

e. Mid-dorsal thoracic black stripe at least a little wider than either pale antehumeral stripe.

Rear of head chiefly black.

Larger species (abd. 24 mm. or longer, hind wing 18 mm. or longer).

Pale dorsal colors of abd. segs. 4–6 reduced to a line or absent. (Some *reclusa* fall here although properly belonging under B).

Pale dorsal colors of 4–6 more than a line ; black humeral stripe forked in its upper third to two-fifths, lower branch of inferior appendages more acute than the upper, the latter not directed at all caudad............................*smithiana.*

Smaller species (abd. 22.5 mm. or less, hind wing 15.5 mm. or less) ; abd. segs. 4–7 with the pale mid-dorsal color reduced to a line or absent ....*thisma.*

Rear of the head chiefly pale, abd. segs. 1–7 clear blue violet, 3–7 with a terminal black ring, abd. 26, hind wing 19–20 mm. (From de Selys' description)..*lilacina.*

ee. (not represented).

AA (not represented).

2. Thoracic dorsum brilliant metallic copper.

G. Labrum chiefly metallic copper at least in its basal half; apical half, or only its front edge, yellow ; lower branch of the inferior appendages less robust than the upper branch.

H. (not represented).

HH. Abd. segs. 3–7 black on dorsum, basal half of 3–6 blue, 8–10 blue on dorsum......... ....*jocosa.*

HHH. Abd, segs. 3–6 blue on dorsum apical third to sixth black, 7 black with a basal blue ring, 8–10 blue on dorsum. *cupraurea.*

GG. Labrum yellow or orange throughout; lower branch of inferior appendages as robust as the upper branch, or more robust.

J. (not represented).

JJ. (modified). Abd. segs. 3–7 black on dorsum with a narrow transverse basal blue ring, 8–10 blue on dorsum ....*orichalcea ?:*

II. Total area of dark colors on abdominal segments 3–6 and thoracic dorsum *less* than the pale areas on the same parts.

1. Dorsum of abd. seg. 7 chiefly black, rear of head chiefly black, postbasal black streaks on 3–6, 8 and 9 blue, with an inferior black stripe on each side.

K. Inferior appendages longer than high at apex, deeply excised at tip.

L. Black mid-dorsal thoracic stripe wider than the carina.

Pale colors blue.

tinctipennis and *chapadæ* (for their differences see under the latter, *posteà*).

Pale colors violaceous..*botacudo.*

LL. (not represented).

KK. Inferior appendages higher at apex than long.

Black mid-dorsal thoracic stripe wider than the carina ....*tupi.*

Black mid-dorsal thoracic stripe reduced to a line upon the carina only. *subapicalis.*

2., 3., 4. (not represented).

Females.

§I. Dorsum of abdominal segments 3–6 mostly black.

A. Dorsum of abd. segs. 8 and 9 pale with black markings.

B. These markings consisting of two stripes occupying only the basal half (more or less) of 8 and 9.

C. (not represented).

CC. These stripes more or less confluent with each other.

CC. 1. Antenodal cells on the front wing 4.

D. (not represented).

DD. Mesepisternal tubercles absent.

DD. 1. Antenodal cells on the hind wing 4.

Pale antehumeral stripe one-half as wide (or less) as the black mid-dorsal, no mid-dorsal blue stripe on abd. segs. 4–6, rear of head black..... *sordida.*

Pale antehumeral stripe three-fourths as wide (or more) as the black mid-dorsal blue stripe present on the greater part of the length of 4–5 or 6, rear of head chiefly pale..........*fosteri.*

DD 2. Antenodal cells on the hind wing 3.

E. A pale mid-dorsal stripe on abd. segs. 3–5.

Mesepimeral part of the humeral stripe black.

Abd. seg. 10 black on dorsum with a pair of pale spots, mesepimeral branch of the black humeral stripe reaching to the upper margin of the sclerite......*oculata.*

Abd. seg. 10 blue, mesepimeral branch of the black humeral stripe not reaching to the upper margin of the sclerite. *hasemani.*

Mesepimeral part of the forked humeral stripe pale brownish, abd. seg. 10 black. *gerhardi.*

EE. A pale mid-dorsal stripe on abd. seg. 3 only, or a mere line on 3–6.

F. Abd. seg. 10 pale on dorsum.

F. 1. Labrum largely or wholly black, mesostigmal lamina erect and projecting, mesepimeral branch of the black humeral stripe reaching to the upper margin of the sclerite. *difficilis.*

F. 2. Labrum pale, mesostigmal lamina a carina forming the anterior margin of a groove .... *mollis.*

FF. Abd. seg. 10 black, labrum pale, mesepimeral branch of the humeral stripe pale brown.

Some *gerhardi.* (See above under E.)

CC. 2. Antenodal cells on front and hind wings 3.

Black of frons reaching down to nasus, mid-dorsal blue on 3 and 4 a mere line.................................... *tinctipennis.*

Black of frons reaching only as far down as the level of the first antennal joint or not so far, mid-dorsal blue on 3 and 4 a stripe.

Black humeral stripe of subuniform width, not forked, but enclosing a very small pale spot superiorly.... *botacudo.*

Black humeral stripe widening considerably in its upper third, which is forked, humeral branch more than a line .... *chapadæ.*

Black humeral stripe widening in its upper third on half, which is forked; humeral branch hardly more than a line.. *smithiana.*

BB. (not represented).

BBB. These markings consisting of two stripes as long as 8 and nearly as long as 9.

BBB. 1. Antenodal cells 5 on the front wing, 4 on the hind.

G. Mesepisternal tubercles well-developed.

H. Abd. seg. 10 pale with a pair of dark spots on the dorsum. *translata.*

HH. Abd. seg. 10 pale, unspotted on dorsum.

J. (not represented).

JJ. Thoracic dorsum and usually the vertex, nasus, and labrum also, with a coppery-red reflection. *cupraurea* (and *cuprea*).

GG. Mesepisternal tubercles absent.

b. Mesepimeral black stripe reaching upward to or almost to the upper margin of the sclerite, dark colors on head and thorax with some metallic reflection.
orichalcea (and *œnea*).

bb. (not represented).

BBB. 2. Antenodal cells 4 on both front and hind wings; inner edge of mesostigmal lamina continued caudad as a flattened ridge, rear of head chiefly pale..........................*iralai.*

BBB. 3. Antenodal cells more often 3 on all the wings.

Black humeral stripe not interrupted or forked, abd. segs. 3 and 4 chiefly violaceous......................................*botacudo.*

Black humeral stripe interrupted, a shorter part on the upper end of the humeral suture, a longer and diverging mesepimeral part, 3–4 chiefly black dorsally with a pale median line
Some *reclusa* will fall here. (See also below.)

AA. Dorsum of abd. seg. 8 chiefly black, of 9 as in B or BBB, a pale mid-dorsal line on 3–6.

AA. 1. Abd. seg. 10 pale on dorsum, no mesepisternal tubercles...*reclusa.*

AA. 2. Abd. seg. 10 chiefly black on dorsum, mesepisternal tubercles present...*translata.*

§ II. (not represented.)

41. **Argia translata** Hagen.

Calvert, Biol. Centr.-Amer. Neurop., pp. 76, 361, pl. IV, figs. 18, 30, 30 *s.* 1902, 1907.

COLOMBIA: Bonda, in Dept. Magdalena, July, 1 ♀, August, 6 ♂ 1 ♀, September, 1 ♂ 1 ♀, October, 1 ♂, November, 1 ♀. H. H. Smith. Carnegie Museum, Pittsburgh.

Three of these females (August, September, November) have the nasus chiefly or wholly black, the fourth (July) has it black posteriorly; all four have a perpendicular black line connecting the black of frons and of nasus.

42. **Argia reclusa.**

(PLATE IV, FIG. 66.)

Argia reclusa Selys, Bull. Acad. Belg. (2) xx, p. 395, 1865. Hagen and Calvert, Bull. Mus. Comp. Zoöl., xxxix, p. 114, pl. 2, figs. 20*a*, 20*b* (♂ apps.), 1902.

♂. In most of the examples from Chapada and in that from Sapucay, the black of the frons extends between the antennæ broadly down to the nasus; in six specimens from Chapada and the two from Sete Lagoas the black is constricted for a shorter or longer distance to a perpendicular median line, but widens again at the fronto-nasal suture; the longer the constriction the less black on the anterior surface of the first antennal joint, which joint is entirely black in those specimens in which the black is not constricted but extends broadly down to the nasus. Almost the whole nasus and labrum blue. Prothorax with a round blue spot on each side of the dorsum of the middle lobe, and each lateral end of the hind lobe is blue. The pale (blue) antehumeral stripe was described by de Selys as not reaching to the upper margin of the sclerite, but it does reach there in all the present material; its upper end is decidedly narrower and has in some specimens almost entirely faded out, and the Selysian type may have been just such an example; at mid-height the pale antehumeral stripe is from two-fifths to one-fourth as wide as the black mid-dorsal. Much variation exists in the black humeral stripe, even in those males from Chapada which have not the black of the frons constricted; the humeral stripe varying from a condition in which it is as wide as the pale antehumeral at mid-height and is of subuniform width almost to the upper end of the mesepimeron, through conditions in which it is narrower and forked in the upper part of its extent, the humeral branch reaching the upper end of its suture, the mesepimeral branch falling far short of the upper margin of its sclerite, to those where the stripe is broken into two separated parts, a shorter on the upper end of the humeral suture, a longer diverging from the lower part of that suture and running upward on the mesepimeron to about two-thirds, or less, of the height of that sclerite, tapering upward to an acute point. The black stripe on the second lateral thoracic suture is often sharply defined. Abdominal segments 4–6 may have a fine pale mid-dorsal line; 8–10 have an inferior black stripe on each side as long as the segments.

♀ (*not hitherto described*). Differs from the male as follows: In only one specimen does the black of the frons extend broadly down between the antennæ to the nasus; in all others it is more or less constricted or, in four out of twenty-five heads from Chapada, the black of the frons is separated from the black line on the fronto-nasal suture by pale ochre, which color generally replaces the blue of the male on head and thorax. In all the present material the black humeral stripe is in the last of the conditions described above for the male, *i. e.*, broken into a shorter upper humeral portion and a longer lower mesepimeral portion, the latter reaching upward to from three-fifths to five-sixths of the height of the sclerite, but never attaining the site of the first lateral thoracic suture, nor curving backward at its upper end; black line on the second lateral thoracic suture of variable length.

The dorsal violet spot of abdominal segment 2, which at its widest in the male is more than half as wide as the segment, is here reduced to a stripe never more than one-third as wide as the segment and often still narrower. The dorsal surface of abdominal segment 8 is black for its entire length in most of the ten specimens in which this segment is present, this solid black dorsum evidently due, as some examples show, to a fusion of two longitudinal stripes along the mid-dorsal line, each dorsal stripe also fusing for a variable part of its length from the anterior end backward with the adjoining inferior lateral black stripe present also in the male; each dorsal black stripe is occasionally broken into a stripe followed by a black spot at the hind end of the segment. Abdominal segment 9 has a pair of dorsal black spots or short stripes extending from the anterior end to one-half or three-fifths of the length of the segment, confluent with each other only at the extreme base, but each one confluent to a greater extent with the adjoining inferior lateral black stripe, which latter usually, but not always, reaches to the hind end of the segment; 10 pale (blue?) with no black markings. In the male the inferior lateral margin of the abdominal segments is pale yellowish or bluish, except at the hind end of each segment, there being no black lines or stripes on 1–7 distinct from the dorsal black; the females agree, although the inferior lateral pale color is rather wider.

In both sexes an interrupted pale transverse occipital line may, or may not, exist between the right and left postocular spots.

Dimensions: Abdomen ♂ 26–28 (Chapada), 28–29 (Sete Lagoas), 30.5 (Sapucay), ♀ 25.5–28 (Chapada); hind wing ♂ 18–20 (Chapada), 20.5–21 (Sete Lagoas), 21.5 (Sapucay), ♀ 19.5–21.5 (Chapada) mm.

Habitat: BRAZIL, Chapada, by H. H. Smith, 15 ♂ and parts of 20 others, some numbered 48, 83, 110, 110*a* and 112, 8 ♀ and parts of 21 others, some numbered 47 and 111, some dated May; Sete Lagoas, Minas Geraes, by J. D. Haseman, May 6, 1908, 2 ♂. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, January 16, 1903, 1 ♂ numbered 33 (others numbered 33 belong to *A. fosteri* and *A. thisma*). United States National Museum.

The variations in the form of the black humeral stripe of *A. reclusa* resemble some of the conditions found in *A. mollis*. This is especially true of the females, and, although four antenodal cells are more frequently found on the front wing of *mollis* and three on that of *reclusa*, yet not rarely individuals of the one species possess this character of the other. The following appear to be more constant features separating the females: *reclusa* female has a small but distinctly developed mesostigmal lamina (see pl. IV, fig. 66) which is distinctly visible as a projection when the thorax is examined from the side in profile view (the homolog of the lamina, see page 135, in *mollis* not visibly projecting), no black marks on the nasus other than at the fronto-nasal suture, the dorsal black stripes on abdominal segment 8 usually reaching the whole length of the segment. Compare also the descriptions of the black humeral stripe in *mollis* and *reclusa* females.

43. **Argia sordida.**

Argia sordida Hagen, Bull. Acad. Belg. (2) xx, p. 387, 1865. Hagen & Calvert, Bull. Mus. Comp. Zoöl., xxxix, p. 114, pl. 1, fig. 20 (labium), pl. 2, figs. 3, 3*a* (appendages ♂), 23 (mesostigmal laminæ ♀), 1902.

The only existing description of the colors of this species — the original one of 1865 — is comparative only and so brief as to give little information, wherefore the following, based in part on some of Hagen's cotypes.

♂. Rear of the head black. Pale antehumeral stripe three-fifths as wide as the black mid-dorsal. Black humeral stripe not forked above, gradually widening from above downward; at mid-height one third to one fourth as wide as the pale antehumeral. A short black mark at the upper end only of the second lateral thoracic suture. Abdominal segment 2 violet, with a black stripe on each side from anterior to posterior end, which stripe just before the latter end widens, so as to approach closely, but not meet, its fellow of the opposite side on the dorsum; 3–7 black, with a transverse basal blue-violet ring prolonged on 3 as a mid-dorsal stripe tapering posteriorly to four-fifths of the segment, prolonged on 4 similarly to one-fourth of the segment, while on 7 the ring is mid-dorsally interrupted with black; 8–10 dorsally pale brown in the dried specimens (blue? in life), their sides black from end to end, the black more extensive at the hind end, especially on 8, where it approaches that of the opposite side on the dorsum, finally meeting it at the extreme hind end of the segment or in the hindmost sixth; or on 10 the black may so invade the dorsum as to leave only two small pale spots thereon. Compared with Hagen's figures cited above, the inferior appendages seen in profile are less deeply bilobed at the apex than shown in his figure 3*a*, with the result that the lower lobe or branch is less acute.

The male from Sao Sebastião has the blue-violet mid-dorsal stripe on 3 reaching to only two-fifths of the segment and no mid-dorsal stripe on 4, but otherwise it seems like the others.

♀. Differs from the male as follows: A pale stripe bordering the eyes posteriorly. Pale anthumeral stripe nearly half (or two-fifths in one Rio Janeiro ♀) as wide as the black mid-dorsal at mid-height, the black humeral stripe half to nearly as wide as the pale antehumeral at the same level. Black lateral stripes of abdominal segment 2 meeting on the dorsum in the first, sixth, and eighth eighths of the segment's length, so that the blue on the dorsum is limited to an elliptical spot reaching from the second to the fifth eighth inclusive, and a smaller isolated spot or dot in the seventh eighth. Transverse basal blue ring on 3–7 mid-dorsally interrupted with black; blue mid-dorsal longitudinal stripe on 3 reaching back to two-thirds or three-fourths of the segment's length, but not confluent with the transverse basal blue ring; no mid-dorsal blue stripe on 4. 8–10 predominantly black, pale brown (blue? in life) forming a posterior dorsal border to 8 and 9 the anterior margin of which is straight on 9, but trilobed on 8, the middle lobe tapering forward to nearly the basal fourth of the segment, or trilobed on both 8 and 9, the middle lobe soon becoming a mere line prolonged forward mid-dorsally, or this middle lobe prolonged forward as a wider stripe almost to the base of 9 and to the basal fourth of 8; dorsum of 10 may be chiefly pale or wholly black. Mesepisternal tubercles cannot be said to be present in this species; only a very low convexity occupies the site of each. Three Nova Friburgo females have longer abdomens (31 mm.), two of the Rio de Janeiro examples have shorter hind wings (24 mm.) than the previously published dimensions admit.

All the wings of all the specimens listed below have four antenodal cells distal to the quadrilateral (except 5 in one front wing of 1 Rio de Janeiro ♀) and in all the pterostigma surmounts more than one cell — rarely as much as two cells.

Habitat: BRAZIL, Nova Friburgo in Rio by Beschke, cotypes of Hagen, 4 ♂ 2 ♀. Museum of Comparative Zoölogy. 1 ♂ 2 ♀. Collection of P. P. Calvert, ex coll. P. R. Uhler.

Rio de Janeiro, in November and December, by H. H. Smith, 1 ♀ and parts of 2 others. Carnegie Museum.

Sao Sebastião in 1900 by A. Hempel, 1 ♂. Academy of Natural Sciences.

The original description states that this species is "Presque sembable à l'*A. Claussenii*," after which remark some differences from *claussenii* are given, without any mention of the abdomen. The abdomen of *claussenii* is described as blue, "Les segments *2e–8e* terminés et bordés latéralement de noir. Cette couleur occupant plus d'espace sur les derniers." One might, therefore, have expected a larger area of blue on the abdomen of *sordida* than examination of the cotypes described above proves to be actually the case.

44. **Argia fosteri** sp. nov.

(PLATE IV, FIGS. 58, 69, 69*s*.)

♂. Rear of the head chiefly pale, with distinctly less or almost as much black around the occipital foramen. Pale (blue) antehumeral stripe half to three-fifths as wide as the black mid-dorsal. Black humeral stripe forked in its upper half or third, both branches of the fork reaching to the upper margin of the sclerite; below the fork the humeral stripe is a little wider than the pale antehumeral. A brown line on the whole length of the second lateral thoracic suture except at the upper end which is black. Abdominal segment 2 blue, with a black stripe on each side from end to end, widened mesad at four-fifths of the segment's length toward, but not meeting, its fellow of the opposite side, the mid-dorsal blue on the anterior part of the segment being half as wide as the segment, or the right and left black stripes may fuse on the dorsum for the hindmost third of the segment and the mid-dorsal blue on the anterior two-thirds is reduced in width; often from the inferior edge of each lateral black stripe there extends backward (caudad) an oblique fork or branch toward or to the inferior margin of the segment at about two-thirds of its length. Abdominal segments 3–7 black, with a transverse basal blue ring which on 3–5 or 6 is produced, tapering backward, as a mid-dorsal stripe reaching to two-thirds or one-half of 3, one-fourth to two-fifths of 4, and one-fifth of 5 and 6; the inferior lateral margins of 3–7 narrowly blue, except in the hindmost fourth to sixth of each segment; 8–10 blue, with an inferior black stripe on each side as long as the segments, or not occupying the most anterior third of 8; in some a pair of posterior dorsal black spots on 8.

Wings yellowish throughout; stigma with the distal side more oblique than the proximal.

♂ (*immature*). Differs from the preceding description in having very little dark color on the rear of the head, excepting the transverse blackish stripe, which bounds the pale postocular spots posteriorly; only the upper end of the humeral branch of the humeral fork is indicated by a brownish spot; abdominal segment 2 marked as in the first case above described, no oblique branch from the lateral black stripe; the black markings of the adult are generally bronze-green.

♀. Differs from the male as follows: Rear of the head as described for the immature male; pale (blue) antehumeral stripe at mid-height three-fourths as wide to nearly as wide as the black mid-dorsal; black humeral stripe below the fork subequally wide to two-thirds as wide as the pale antehumeral; abdominal segment 2 marked as in the second case described above for the male, no inferior oblique branch from the lateral black stripe, although in some specimens an isolated round brown spot appears to represent it; transverse basal blue ring on 3–7 much narrower, mid-dorsally interrupted with black in some specimens, a narrow blue mid-dorsal stripe on 3–5 or 6, extending from the transverse basal pale ring (or from just behind it, when it is interrupted) to two-thirds or three-fourths of the length of each segment; 8–9 marked as in the male, but having in addition a pair of longitudinal dorsal black stripes, extending from the base to three-fifths or two-thirds of the length of each segment, the two on 8 united on the mid-dorsal line from base backward (caudad) for a varying distance, while on 9 they are connected only by a fine transverse line at the extreme base; the hind ends of these black stripes narrower, rounded; in some specimens a black line on the transverse posterior row of spines of one or both of 8 and 9; 10 blue, with no black markings even on the sides.

♂ ♀. Stigma of front wings surmounting more than one (45 per cent. ♂, 50 per cent. ♀), one (40 per cent. ♂, 50 per cent. ♀) or less than one (15 per cent. ♂) cell; of the hind wings surmounting one (60 per cent. ♂, 87.5 per cent. ♀) or more than one (40 per cent. ♂, 12.5 per cent. ♀) cell.

Antenodal cells on the front wings 4 (55 per cent. ♂, 62.5 per cent. ♀), 5 (35 per cent. ♂, 37.5 per cent. ♀), or 4 + (10 per cent. ♂); on the hind wings 4 (80 per cent. ♂, 100 per cent. ♀), 3 (15 per cent. ♂) or 4 + (5 per cent. ♂). These percentages based on 10 ♂, 4 ♀.

Dimensions: Abdomen ♂ 28.5–30, ♀ 27–29; hind wing ♂ 22–23.5, ♀ 23–25 mm.

Habitat: PARAGUAY, Sapucay, by W. T. Foster; November, 1899, 5 ♂ 1 ♀ (collector's number 15), 1 ♂ 3 ♀ (collector's number 16 — this number is attached also to 2 ♀ of another species); January 11 and 16, 1903, 4 ♂ (collector's number 33, which is attached also to a male of *Argia thisma* and a male of *A. reclusa*). U. S. National Museum.

45. **Argia gerhardi** sp. nov.

(PLATE IV, FIGS. 60, 70, 70*s*.)

♂. Rear of the head black, a narrow pale stripe along each eye margin; black of the frons not reaching as far down as the bases of the antennæ, the first joint of which is pale anteriorly. Pale (violet) antehumeral stripe half as wide as the black mid-dorsal which latter often has a dark green reflection. A dark line on the entire length, or on only the upper part of the humeral suture, in the former case wider at its upper end; from the lower end of the suture extends upward a pale brownish mesepimeral stripe having some bronzy-green reflection and which diverges from the suture, ending a little below the upper margin of the sclerite and a little anterior to a short black line usually present on the upper end of the obsolete first lateral suture, or this pale brown stripe may be wider and border the humeral suture for its whole length, reaching the upper margin of the mesepimeron and back to the obsolete first lateral suture and at mid-height may equal in width the pale antehumeral. Second lateral thoracic suture with a stripe for its entire length, brownish below, blackish above, on the stripe almost obsolete except at the upper end. Abdominal segment 2 blue dorsally, each side with a longitudinal black stripe reaching from base to five-sixths of the segment's length, widening mesad to its hind end, but not meeting its fellow of the opposite side, sometimes broken into a stripe and a spot; dorsal blue between these two stripes at its widest two-thirds as wide as the segment; side below the black stripe pale, yellowish, unmarked. Segments 3–7 black, with a narrow transverse basal pale ring, which on 3–5 is confluent with a mid-dorsal violet or blue stripe, tapering posteriorly, reaching to five-sixths or the whole length of 3, to half or five-sixths of 4, to two-fifths or not beyond the basal ring of 5, or 5 and 6 may have a fine pale mid dorsal line on the greater part of their length; sides of 3–6 inferiorly pale, except in the hindmost sixth. Segments 8 and 9 blue, with an inferior black stripe on each side as long as the segments, or interrupted on 8; 10 black.

♀. Differs from the male as follows: a short pale line on each side of the vertex of the male, between lateral ocellus and adjoining antenna, is enlarged in young, but not in older females, into a spot, which in the young may, or may not, be confluent with the spot of the opposite side; black of the frons incised on each side of the median ocellus in the younger; but not in the older specimens; black mid-dorsal thoracic stripe in some without any green reflection; humeral line and mesepimeral stripe paler and indistinct, no black line on the upper end of the obsolete first lateral thoracic suture in younger females; second lateral suture with a short black line on its upper part only; dorsal blue of abdominal segment 2 reduced to a narrow stripe as long as the segment, lateral black stripe wider and reaching the entire length of the segment; blue mid-dorsal stripe on 3 and 4 as long as in the male, but narrower, even reduced to a line in some; 5 and 6 with a fine pale mid-dorsal line; 8 and 9 have in addition to the inferior lateral black stripe on the male a dorsal black spot occupying the first two-fifths to three-fourths of 8, half to two-thirds of 9, divided at its hind end (∴ = two fused longitudinal stripes) and confluent on each side at base with the inferior lateral black stripe; in some a small apical dorsal black spot on 9, with which in three specimens the basal black is united, thus forming a complete mid-dorsal black stripe narrowing posteriorly; some pale spots on 10 in younger females.

♂♀. Wings pale yellowish or pale brownish. Stigma of the front wings surmounting more than one (63 per cent. ♂, 86 per cent. ♀), one (33.3 per cent. ♂, 10 per cent. ♀) or less than one (3.3 per cent. ♂♀) cell. Stigma of the hind wings surmounting more than one (73 per cent. ♂, 90 per cent. ♀), one (23 per cent. ♂, 10 per cent. ♀) or less than (3.3 per cent. ♂) cell.

Antenodal cells on the front wings 4 (93 per cent. ♂, 83 per cent. ♀), 3 (10 per cent. ♀), 3 + (3.3 per cent. ♂ ♀), 4 + (3.3 per cent. ♂) or 5 (3.3 per cent. ♀); on the hind wings 3 (86 per cent. ♂, 100 per cent. ♀) or 3 + (14 per cent. ♂). All the percentages based on 15 ♂, 15 ♀.

Dimensions: Abdomen ♂♀ 25–29.5; hind wing ♂ 20–22; ♀ 21–24 mm.

Habitat: BOLIVIA, Chulumani by W. J. Gerhard, November 30, 1898 – January 7, 1899, 28 ♂ 18 ♀; Road to Coroico, Yungas, by the same, April 7, 1899, 2 ♂ 1 ♀, April 8, 1 ♀, and April 20, 1899, 1 ♂. Academy of Natural Sciences of Philadelphia.

45*a*. **Argia gerhardi nigrior** subsp. nov.

♂. Differing from the typical *gerhardi* in that on the lowest fourth of the mesipimeron is a black spot as wide as the pale antehumeral stripe and continued in subequal width upon the mesinfraepisternum; nearly all the remainder of the mesipimeron is pale brown with less bronzy-green reflection than in *gerhardi* type; the black stripe on each side of abdominal segment 2 reaches to the hind end of the segment by a narrow prolongation of its lateral edge. These differences appear to be indicated in teneral examples also.

Stigma of the front wings surmounting more than one (60 per cent.), one (33.3 per cent.) or less than one (6.7 per cent.) cell; of the hind wings surmounting more than one (97 per cent.) or less than one (3.3 per cent.) cell.

Antenodal cells on the front wings 4 (93 per cent.), 3 + (3.3 per cent.) or 3 (3.3 per cent.); on the hind wings 3 (97 per cent.) or 3 + (3.3 per cent.). Percentages based on 15 ♂.

♀. The single female which can be referred here differs from the same sex of typical *gerhardi* by having the ninth abdominal segment entirely black; it does not possess the black mesepimeral spot of the male.

Dimensions: Abdomen ♂ 26–29, ♀ 27; hind wing ♂ 19–21, ♀ 21.5 mm.

Habitat: BOLIVIA, near Coroico, Yungas, by W. J. Gerhard, April 11, 1899, 6 ♂, May 9; 1 ♀; road to Coroico, April 19, 3 ♂; twelve miles northeast of Coroico, by the same, May 20, 1899, 9 ♂, May 24, 1 ♂. Academy of Natural Sciences of Philadelphia.

That *nigrior* is a geographical, not a seasonal, form of *gerhardi* is evidenced by the facts that typical *gerhardi* and *nigrior* were taken at nearly the same time, and that the peculiar markings of *nigrior* are indicated in teneral (immature) individuals.

46. **Argia kokama** sp. nov.

(PLATE IV, FIGS. 71, 71*s*.)

♂. Black of the frons reaching down between the bases of the antennæ as a moderately wide band to the nasus. Rear of the head black, a very narrow pale stripe bordering the eye-margins inferiorly.

Pale (violet) antehumeral stripe three-fifths as wide as the black mid-dorsal. Black humeral stripe of subuniform width, as wide as the pale antehumeral, not forked. A blackish-brown stripe three-fourths as wide as the black humeral on the entire length of the second lateral thoracic suture.

Dorsum of abdominal segment 2 violet occupying two-thirds of the width of the segment, bounded on each side by a black stripe extending the entire length of the segment and widened mesad at four fifths length, but not meeting its fellow of the opposite side, subsequently narrowed in the hindmost fifth; this black stripe appears to be due to a fusion of two narrower parallel stripes, one superior, one inferior, probably more or less separated from each other in earlier stages; inferior lateral margin of the tergite of 2 pale for its entire length.

Dorsum of 3 and 4 predominantly violet, a longitudinal black stripe on each side meeting its fellow of the opposite side in the hindmost sixth of the dorsum; 5–7 black, with a narrow transverse basal pale ring; 8–9 blue, with a black stripe on each side as long as the segments; 10 black.

Wings faintly obscure yellowish, stigma surmounting slightly more than one cell on all. Front wings with four antenodal cells, hind wings with three.

Abdomen 23.5, hind wing 16.5 mm.

♀ unknown.

Habitat: PERU, Iquitos, Staudinger, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

The specific name proposed is that of a human tribe of the vicinity.

The type specimen is pruinose on the sides of the prothorax, mesepimeron and metepimeron before and behind the brown stripe of the second lateral suture, pectus, coxæ, some of the sclerites of the interalar dorsal area, and parts of the dorsum and sides of the first abdominal segment.

47. **Argia oculata** Hagen.

Argia oculata Calvert, Biol. Centr.-Amer. Neurop., pp. 81, 367; pl. iv, figs. 11, 36, 36*s*, 36*i–ii*. 1902, 1907.

Purely for convenience the present material is grouped into two lots: *a.* Northern South America.

COLOMBIA, Cacagualito, in Dept. Magdalena, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

VENEZUELA, La Guaira, by Lyon and Robinson, July 3, 1900, 3 ♂; San Julian, by M. W. Lyon, Jr., July 20, 1900, 2 ♂.

b. Southwestern Brazil.

The following notes apply only to the Brazilian specimens.

♂. Differs from the northern, typical *oculata* Hagen chiefly in its smaller size (see below). Blue spots on the dorsum of the middle prothoracic lobe sometimes absent. Blue antehumeral stripe two-fifths to one-half as wide as the black mid-dorsal at mid-height. Black humeral stripe very slightly wider at its two ends, occupying nearly all of the mesepimeron, at mid-height 1¼ times to equally as wide as the blue antehumeral, not forked[13] but enclosing a very small blue spot at its upper end, or forked in the upper third or less as in typical *oculata,* or in one example in the upper half, the humeral branch of the fork being a mere line except at its upper end, both branches reaching to the upper margin of the sclerite. A black stripe on the whole length of the second lateral thoracic suture, or occasionally obsolete, except at the upper end. The width of the dorsal blue on the anterior part of abdominal segment 2 is $\frac{1}{3}$ to $\frac{3}{5}$ of that of the segment; the mid-dorsal blue tapering posteriorly on 3–6 reaches from the base backward to three-fourths or four-fifths of the length of 3, two-thirds to four-fifths of 4, one-third to two-thirds of 5, one-tenth to one-half of 6. Stigma of the front wings surmounting more than one (55 per cent.) or one (45 per cent.) cell, of the hind wings surmounting one (60 per cent.) or more than one (40 per cent.) cell. Antenodal cells on the front wing 4 (80 per cent.) or 3 (20 per cent.), on the hind wings 3 (95 per cent.) or 4 (5 per cent.). Percentages based on 10 ♂.

Abdomen 27–29.5 mm.; hind wing 18–21.5 mm.

♀. Of the females which have been labeled by the collector with the same numbers as the males, or which appear to be conspecific, none have more than the first six of the abdominal segments, some still less. The mesostigmal laminæ are very similar or identical with that figured[14] for *oculata* ♀ and resemble less the corresponding figures for *A. difficilis*[15] and *A. adamsi* §. In all the labrum is either bordered and medially crossed with black, or is wholly black; there is more or less black on the nasus, and the black of the frons reaches down between

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[13] In *oculata* from Mexico, etc., the humeral stripe is often forked in its upper third or less, although I have spoken of it as "not forked" in the "Biol. Centr.-Amer. Neur.," p. 81. This is one of the cases referred to, *antea,* pp. 117–118, where I think it desirable to enlarge the meaning of the word "forked" used in this connection.

[14] Biol. Centr.-Amer. Neur. tab. 4, fig. 11.

[15] *L. c.* tab. 4, fig. 15. § *L. c.* tab. 10, fig. 5.

the antennæ to the nasus in the form of a median perpendicular line, or of a wider stripe; in all cases where the segments are present, 3–5 have the mid-dorsal blue *stripe* (not line) reaching to at least half of the length of each segment, and 6 has a blue line reaching to one-fourth length. The length of the hind wing varies from 19.5 to 23 mm.

Habitat: BRAZIL, Chapada, by H. H. Smith, 3 ♂ and parts of 10 others, some numbered 186, 187; parts of 8 ♀, some numbered 186, 186*a*, 186*b*. Carnegie Museum, Pittsburgh.

48. **Argia mollis.**

(PLATE IV, FIG. 61.)

Argia mollis Hagen in Selys, Bull. Acad. Belg. (2) xx, p. 398. 1865. Hagen & Calvert, Bull. Mus. Comp. Zoöl. xxxix, p. 112, pl. 1, figs. 14, 14*a*. 1902.

♂. The males referable to the above-quoted description and figure show the following slight differences from the former: prothorax often with a pair of dorsal blue spots on the middle lobe, a black stripe on the entire length of the second lateral thoracic suture, the dorsal oval violet spot reaches the hind end of abdominal segment 2, 3 has a narrow mid-dorsal violet stripe, tapering posteriorly, for more than the anterior half of the segment; abdomen 27–29, hind wing 20–21 mm.

The following details may also be added: Black of the frons apparently extending down between the antennæ to the nasus, but its outlines in the present material are often difficult to trace; 8–10 have an inferior black stripe on each side as long as the segments; antenodal cells on the front wings usually four, on the hind three.

There is much variation in the black humeral stripe from the condition (*a*) where it is, at mid-height, one-and-one-half times as wide as the pale antehumeral, wider at both ends, its width at the upper end extending from the humeral suture to the obsolete first lateral and enclosing a small pale spot; through (*b*), where at mid-height it is only half as wide as the pale antehumeral and is forked for its upper half or less, the mesepimeral branch reaching up only seven-eighths of the way to the upper margin of the sclerite and curved toward, but stopping short, of the obsolete first lateral suture (on the upper end of which latter is a short isolated black line), the humeral branch a line except at its upper end where it reaches the upper margin of the sclerite; to (*c*), where the mesepimeral branch reaches up only three-fourths of the way to the upper margin of the sclerite and is not all curved toward the obsolete first lateral suture. Condition (*a*) would appear to be that nearest the typical *mollis*, judging from the expression "Thorax noir en avant jusque vers la Ire suture latérale." One male of condition (*c*) has a black stripe on the upper end only of the second lateral thoracic suture and the dorsal violet of abdominal segment 2 apparently not reaching to the hind end of the segment, thus approaching the type in these two respects.

♀. The female of this species has not been described. Females labeled by the collector with the same numbers as the preceding males differ from them as follows: Black of the frons extending broadly down between the antennæ, but abruptly contracted to a narrow median "isthmus" before again widening at the fronto-nasal suture; nasus with a pair of small black marks; pale antehumeral stripe at mid-height half to two-fifths as wide as the black mid-dorsal (*i. e.* a little wider than in the ♂); black humeral stripe at mid-height half to equally as wide as the pale antehumeral, forked in its upper fifth or more, mesepimeral branch wider, curved toward the upper end of the obsolete first lateral thoracic suture to which it may or may not reach, humeral branch wider at its upper end which reaches the upper end of the suture, a mere line or even obsolete when the forking is deep, in the latter case of course isolated from the mesepimeral branch; a pale mid-dorsal line on the greater part of 3–5; 8 and 9 in addition to the inferior lateral black stripe have each a pair of dorsal stripes reaching from the base to one-half or two-thirds of 8 or one-half of 9, each fused for the greater part of its length with the adjacent lateral stripe, but with its fellow dorsal at the extreme base only. Each feebly developed mesostigmal lamina appears to form the anterior boundary of a slight obliquely transverse groove, which is bounded posteriorly by a still lower carina, carina and lamina united laterad, slightly divergent mesad, so that the groove is closed laterad but open mesad.

Abdomen 25–29, hind wing 21–22.5 mm.

Habitat:—BRAZIL, Chapada, by H. H. Smith, 15 ♂ and parts of 12 (?) others, some number 164*a*, 123 or 128, some dated May; 13 ♀ and parts of 14 others, some numbered 164*b*. Sete Lagoas, Minas Geraes, May 3, 1908, by J. D. Haseman, 1 ♀. Carnegie Museum, Pittsburgh.

49. **Argia difficilis** Selys.

Argia difficilis Calvert, Biol. Centr.-Amer. Neurop., pp. 84, 369, pls. iv, fig. 15, viii, figs. 42, 42*s*, *x*, 4, 4*s*. 1902, 1907.

Habitat: COLOMBIA, Bonda in Dept. Magdalena, June, 1 ♀, August, 1 ♀, by H. H. Smith. Carnegie Museum, Pittsburgh.

For some comparative notes on this species, see under the following.

50. **Argia hasemani** sp. nov.

(PLATE IV, FIGS. 59, 72, 72*s*.)

♂. Rear of the head black, a narrow pale stripe along each eye-margin; labrum, nasus, and lower part of frons pale (violaceous?). Pale (violet) antehumeral stripe half as wide as the black mid-dorsal. Black humeral stripe at mid-height subequal in width to the pale antehumeral, forked at its upper end, the mesepimeral branch not reaching, the humeral branch reaching, to the upper margin of the sclerite; a short black line at the upper end of the second lateral thoracic suture. Abdominal segment 2 violet above, a black stripe on each side from end to end of the segment, approaching, but not meeting, its fellow of the opposite side on the dorsum just before the hind end, violet of the anterior part of the segment one-half to two-thirds as wide as the segment itself; 3–7 black, with a narrow transverse basal pale ring, which on 3 is prolonged backward as a narrow violet stripe tapering posteriorly to two-thirds of the segment's length; a fine pale mid-dorsal line on the greater part of the length of 4 and 5, the inferior lateral margin of 2–7 pale, more narrowly so at the hind ends of 3–7; 8–10 blue, with an inferior black stripe on each side as long as the segments, in addition to which one male, but not the other, has an anteriorly bilobed black dorsal spot on the posterior half of 8.

♀. Differs from the male as follows: pale predominating (in 2 ♀) on the rear of the head, owing to the widening of the pale stripes along the eye-margins; pale antehumeral stripe one-half to three-fifths as wide as the black mid-dorsal; black humeral stripe three-fifths to two-thirds as wide as the pale antehumeral, shaped as in the male, or (in 1 ♀) forked in its upper half, with the humeral branch a mere line, except at its upper end, where it reaches the upper margin of the sclerite, mesepimeral branch much wider, not reaching the upper margin of the sclerite; pale mid-dorsal color on abdominal segment 2 not more than one-fourth to one-third as wide as the segment, pale mid-dorsal stripe on 3–5 reaching from the pale transverse basal ring to four-fifths or five-sixths of the length of each segment, about one-fifth as wide as 3, and narrower on 4 and 5, tapering posteriorly only slightly at the hind end; inferior lateral black stripe absent from the first fourth of 8 and tending to disappear from the hindmost third of 9; in addition 8 and 9 have a pair of dorsal black stripes, reaching from the base to two-thirds of 8 and half of 9, not confluent with the inferior lateral stripes, and connected with each other at the extreme anterior end of their respective segments, their hind ends narrower, rounded; in one ♀ 8 has a pair of black dorsal spots at the hind end of the segment in line with the two dorsal stripes, thus giving the latter the appearance of being interrupted; 10 entirely blue, its posterior dorsal margin deeply and narrowly cleft.

♂♀. Stigma of all the wings surmounting more than one cell (100 per cent. ♂♀). Antenodal cells of the front wings 4 (75 per cent. ♂, 66.7 per cent. ♀) or 3 (25 per cent. ♂, 33.3 per cent. ♀), of the hind wings 3 (100 per cent. ♂, 66.7 per cent. ♀), 4 (16.6 per cent. ♀) or 3 + (16.6 per cent. ♀). Percentages based on 2 ♂, 3 ♀.

Dimensions: abdomen ♂ 26.5–28, ♀ 25–27; hind wing ♂ 19.5–20.5, ♀ 20–22 mm.

Habitat: — BRAZIL, Fazenda de Amaratu, Bom Fim in the State of Bahia, November 20 and 21, 1907, by J. D. Haseman, 2 ♂ 3 ♀. Carnegie Museum, Pittsburgh.

The male of this species so closely resembles that of *A. difficilis* Selys[16] that I should hesitate to propose a distinct name for it were it not that the females (if I have correctly associated them) show a number of differences from *difficilis* ♀. Both sexes of *A. hasemani* differ from those of *A. difficilis* in having the mesepimeral branch of the black humeral stripe *not* reaching to the upper margin of the sclerite and in having the inferior half of the sides of abdominal segment 2 pale, unmarked with black, while in *difficilis* there is a second longitudinal black stripe on each side of 2 below the one which bounds the dorsal violet; this second or inferior lateral black stripe may be entirely distinct from the superior stripe or united with it to a varying degree, so that in some (probably aged) individuals of *difficilis* the sides of 2 are even wholly black. The males of *hasemani* further differ from those of *difficilis* in that the inferior branch of the inferior abdominal appendages is much less acute. The females of *hasemani* differ from those of *difficilis* by their pale labrum, nasus, and

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[16] See Calvert, Biol. Centr.-Amer. Neur. p. 369.

most of frons (there is a black line on the fronto-nasal suture), their distinctly wider mesostigmal lamina, and the greater extent of pale color on the sides of abdominal segments 3–7, for in *difficilis* ♀ these segments have a second, or inferior, lateral black stripe, as on segment 2, and this may be more or less fused with the superior lateral, fusion being greater on the posterior segments and increasing with age. This inferior lateral black stripe is absent from *hasemani* ♀.

51. **Argia tamoyo** sp. nov.

(PLATE IV, FIGS. 73, 73*s*.)

♂. Rear of the head black, a narrow pale stripe along each eye-margin. Pale (violet) antehumeral stripe at mid-height three-fifths as wide as the black mid-dorsal. Black humeral stripe at mid-height three-fourths as wide as the pale antehumeral, wider at both ends, upper fourth forked, both branches of the fork reaching to the upper margin of the sclerite, mesepimeral branch distinctly curving backward (caudad) to reach the vestige of the first lateral thoracic suture. A narrow black stripe on the entire length of the second lateral thoracic suture. Dorsum of abdominal segment 2 violet, the width of the violet being about half that of the segment, bounded on each side by a black stripe as long as the segment, apparently meeting its fellow of the opposite side on the dorsum in the hindmost third of the segment; 3–7 black, with a narrow transverse basal pale ring which on 3 is confluent with a mid-dorsal violet stripe, tapering posteriorly to about half the length of the segment; 8–10 blue, with an inferior black stripe on each side as long as the segments, 8 also with a pair of dorsal spots on the posterior half of the segment, each spot tapering cephalad.

Wings slightly smoky, stigma on the front and on the hind wing surmounting one cell. Antenodal cells 4 on all wings.

Abdomen 29, hind wing 21.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

The specific name proposed is that of a native human tribe.

The single specimen (type) has lost all of the left hind wing and a large part of the left front.

52. **Argia smithiana** sp. nov.

(PLATE IV, FIGS. 64, 74, 74*s*.)

♂. Rear of head chiefly black, a fairly wide pale stripe along each eye-margin, its upper end prolonged mesad as a narrower stripe behind the black, which bounds the postocular spots posteriorly. Black of the frons not reaching as far down as the base of the antennæ, first antennal joint pale anteriorly, a black line on the fronto-nasal suture, rhinarium dark. Pale (violet) antehumeral stripe at mid-height one half as wide as the black mid-dorsal. Black humeral stripe of subuniform width, or a little wider at the two ends, at mid-height equal in width to, or one and one-fourth times as wide as the pale antehumeral, its upper third to two-fifths forked, both branches reaching the upper margin of the sclerite, humeral branch much narrower than the mesepimeral, which curves backward (caudad) to reach the upper end of the obsolete first lateral thoracic suture. A black line on the second lateral thoracic suture down to the metinfraepisternum. Dorsum of abdominal segment 2 violet, a black stripe on each side as long as the segment, widening mesad a little before the hind end of the segment, but not meeting its fellow of the opposite side on the dorsum, and again narrowing; dorsal violet at its widest about two-thirds (or three-fourths, young) as wide as the segment; side of the segment below the above-mentioned black stripe pale, with an ill-defined longitudinal black stripe confluent at one or two points with the superior stripe and also at the hind end of the segment with a narrow black stripe, which margins the side of the segment inferiorly; these last two stripes rudimentary in young individuals. Segments 3–7 black, a narrow pale (blue or violet) transverse basal ring, which on 3–4 or 6 is confluent with a mid-dorsal blue-violet stripe reaching to four-fifths or five-sixths of 3, half to three-fourths of 4, one eighth to one half of 5, one eighth of 6, or absent on 5 and 6, narrowing posteriorly; in mature individuals the sides of 3–7 are entirely black, or with only a small trace of pale color at three-fourths' length on 3–6, but younger individuals show that this black is due to a fusion of the wider superior black with an originally separate inferior black line extending from just behind the pale transverse basal ring to about two-thirds of each segment's length; 8–10 blue, with an inferior black stripe on each side as long as the segments.

♀. Differs from the male as follows: A pair of indistinct dark spots on the nasus, pale antehumeral stripe blue in some, the forking of the black humeral stripe may affect the upper half thereof; superior black stripe of abdominal segment 2 not narrowed at its hind end, except when the right and left stripes meet on the dorsal and separate the dorsal violet into a larger anterior and a smaller posterior spot, side of this segment chiefly yellowish, with only a short oblique blackish streak at the hind end; mid-dorsal blue on 5 and 6, very narrow, but reaching to four-fifths of 5, three-fifths of 6; inferior line on the sides of 3–7 in younger individuals very faint on 3–6, black, and not fused on 7, in older females black, and fused with the superior black at the hind end only of 3–5 or 6, or at both fronts and hind ends of 6 and 7, or for the whole length on 7; 8 and 9, in addition to the inferior black stripe on each side as in the male, have a pair of dorsal black stripes, pointed posteriorly, reaching from the anterior end of each segment to three-fifths of 8 and to one-half of 9, barely confluent with each other at the extreme base of 8 only, not confluent with the inferior stripes on 8 and barely so on 9; 10 may have an inferior lateral black stripe as in the male, or only a small lateral spot, or no markings.

♂♀. Stigma of the front wings surmounting more than one (75 per cent. ♂, 80 per cent. ♀), one (15 per cent. ♂, 20 per cent. ♀), or less than one (10 per cent. ♂) cell; of the hind wings surmounting more than one (90 per cent. ♂, 80 per cent. ♀), or one (10 per cent. ♂, 20 per cent. ♀) cell.

Antenodal cells on the front wings 3 (90 per cent. ♂, 100 per cent. ♀) or 3 + (10 per cent. ♂); on the hind wings 3 (95 per cent. ♂, 100 per cent. ♀) or 2 (5 per cent. ♂). Percentages based on 10 ♂, 10 ♀.

Dimensions. Abdomen ♂ 25–28, ♀ 22–26; hind wing ♂ 18.5–20, ♀ 17.5–21 mm.

Habitat:— BRAZIL, Chapada, by H. H. Smith, 8 ♂ and parts of 9 others, some dated May, some numbered 165, 118, 4 ♀ and parts of 9 others some numbered 165. Carnegie Museum, Pittsburgh.

53. **Argia thisma** sp. nov.

(PLATE IV, FIGS. 75, 75*a*; PLATE VIII, FIG. 144.)

♂. Rear of the head black, a pale stripe along each eye-margin. Pale (violet) antehumeral stripe one-half to one-third as wide as the black mid-dorsal. Black humeral stripe of subuniform width, one and a half to two times as wide as the pale antehumeral, forked only in its extreme upper end, both the humeral and the mesepimeral branch of the fork reaching to the upper margin of the sclerite. A black line or narrow stripe on the entire length of the second lateral thoracic suture. Dorsum of abdominal segment 2 violet, bounded on each side by a black stripe, which reaches from end to end of the segment and is slightly widened at five-sixth's length and again narrowed to its hind end; the mid-dorsal violet at its widest is one and a half to two times as wide as either lateral black stripe at the same level; below this black stripe each side of the segment is yellowish, or bluish, with an oblique blackish stripe running forward from the hind margin as far as the middle; 3 is chiefly violet in dorsal view, with a narrow black stripe on each side, beginning shortly behind the base and widening on the hindmost fourth or fifth to meet its fellow of the opposite side on the dorsum; 4–7 black with some metallic reflection, each with a narrow transverse basal pale ring, which on 4 is continuous with a mid-dorsal longitudinal violet line or stripe reaching to two-thirds or less of the segment's length; 8 and 9 pale, violet or blue, with an inferior black stripe on each side as long as the segments; 10 black, its hind edge narrowly pale, deeply emarginated mid-dorsally to half, or nearly half, the segment's length, and produced backward over each superior appendage as an acute process. Inferior lateral margins of 3–6 or 7 pale yellow, or blue, except in the hindmost sixth of each segment.

Stigma of the front wings surmounting less than one (78 per cent.), one (11 per cent.) or more than one (11 per cent.) cell; of the hind wings surmounting less than one (72 per cent.) or one (28 per cent.) cell; on all the wings the distal edge is more oblique than the proximal, but more so on the hind pair.

Antenodal cells on the front wings 3 (94.5 per cent.) or 2 (5.5 per cent.); on the hind wings 3 (89 per cent.), 3 + (5.5 per cent.), or 2 (5.5 per cent.).

M_2 (= nodal sector of de Selys) arising on the front wings nearest the sixth (89 per cent.) or seventh (11 per cent.) postnodal; on the hind wings nearest the fifth (89 per cent.), sixth (5.5 per cent.) or midway between these two (5.5 per cent.). (Percentages in these three sentences based on the 9 ♂ from Chapada.)

♀ unknown.

Dimensions. — ♂. Abdomen 20–22.5; hind wing 14–15.5 mm. (That from Sapucay is larger: abd. 23, h. w. 17 mm.)

Habitat: — BRAZIL, Chapada, by H. H. Smith, 8 ♂ and part of 1 other. Carnegie Museum, Pittsburgh. PARAGUAY, Sapucay, by W. T. Foster January 16, 1903, 1 ♂. U. S. National Museum.

The specific name proposed is an anagram from the name of the collector with a terminal *a* added for euphony.

Argia thisma vies with *A. bipunctulata* Hagen of North America as the smallest known species of the genus. It closely approaches the description of *A. lilacina* Selys, also of Brazil, which latter, however, is stated to have the abdomen ♂ 26 mm., hind wing ♂ 19–20 mm., rear of the head yellow, a yellowish lilac antehumeral band almost forked above, the black line on the second lateral thoracic suture incomplete, the first seven abdominal segments clear blue violet, 3–7 with a thick terminal black ring.

In spite of its small size *A. thisma* preserves a character of the genus which on *a priori* grounds might have been expected to disappear, *i. e.*, the origin of M_2 (nodal sector) is still as far distad as the sixth postnodal on the front wings and the fifth on the hind. Stated in another way, enough postnodals are retained to permit of the persistence of this numerical relation to the point of origin of M_2. (Cf. Biologia Centr.-Amer., Neur., p. 376 under *Argiallagma*.)

54. **Argia jocosa** Hagen.

Habitat: — COLOMBIA, Onaca, in Dept. Magdalena, August, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

55. **Argia cupraurea** Calvert.

Argia cupraurea Calvert, Biol. Centr.-Amer. Neurop., pp. 85, 371, pl. iv, figs. 24, 42, 1902, 1907.

Habitat: — VENEZUELA, La Guaira, by Lyon and Robinson, July 4, 1900, 1 ♂, July 27, 1 ♀; San Julian, July 20, 1900, by M. W. Lyon, Jr., 1 ♂. U. S. National Museum.

56. **Argia orichalcea.**

Argia orichalcea Hagen, Bull. Acad. Belg. (2), xx, p. 408, 1875. Calvert. Biol. Centr.-Amer. Neurop., pp 71, 86, 1901. Hagen and Calvert, Bull. Mus. Comp. Zoöl. xxxix, p, 113, pl. 1, figs. 7, 7*a* (apps. ♂), 1902.

♂. The original description of this species states, abdominal segments "3me–6me avec une tache basale bleu foncé occupant presque la moitié au-dessus" and implies that segments 8 to 10 are as in *cuprea*, *i. e.*, 8 black, narrowly pale blue at base, 9 and 10 greenish-blue above. In the *Biologia*, *l. c.* I have given these markings as distinguishing *orichalcea* from *ænea*, stating, however, that I had not seen *orichalcea*. Material from Bonda, Colombia, listed below, although evidently closely allied to *orichalcea* and *ænea*, does not exactly agree with the diagnosis of either of these species, since segments 3–7 are black with a blue transverse basal ring occupying only one-fifteenth of the segments' lengths, and 8, while badly faded in most of the examples, is in others unquestionably blue, with an inferior black stripe each side of variable length, 9 blue with an inferior black stripe each side as long as the segment, 10 similar, or with the black stripe reduced to a spot.

♀. Agrees with the original description of *orichalcea* ♀ except that the mesepimeral branch of the humeral stripe ("bande posthumérale noir bronzé métallique") reaches the short black line on the upper end of the obsolete first lateral thoracic suture in all but one or two examples. I cannot distinguish these females from *ænea* ♀, for, although they seem to have a narrower mesostigmal lamina, I find on re-examining a series of *ænea* females that considerable variation in the width of this structure exists in that species.

Dimensions: abdomen ♂ 26.5–30, ♀ 24–27; hind wing ♂ 18.5–21, ♀ 19–21 mm.

Habitat: — COLOMBIA, Bonda in Dept. Magdalena, by H. H. Smith, 1 ♀ June, 2 ♂ July, 12 ♂ 14 ♀ August, 2 ♂ 1 ♀ September, 1 ♂ October, 1 ♂ 2 ♀ November. Carnegie Museum, Pittsburgh.

I refer these speciment to *orichalcea*, notwithstanding the above-mentioned differences, pending a re-examination of the types.

57. **Argia tinctipennis** Selys.

(PLATE IV, FIG. 62.)

Argia tinctipennis (Bates, Mss.) Selys, Bull. Acad. Belg. (2) xx, p. 396. 1865.
Hagen & Calvert, Bull. Mus. Comp. Zoöl., xxxix, p. 115, pl. 2, ff. 6, 6*a*. 1902.

♂. The black of the frons extends down between the antennæ (but not on the genæ) to the nasus, which latter is blue. At mid-height the pale (blue) antehumeral stripe is one-half to two-fifths as wide as the black mid-dorsal, the black humeral stripe one and one-half times as wide as the pale antehumeral. The intersegmental articulation of 9 and 10 is black.

♀. Agreeing with de Selys' description except that the pale colors are pale browns or blues instead of "jaune olivâtre" or "jaunâtre," differences doubtless due to differences of age. As in the male, the black of the frons extends down between the antennæ (but not on the genæ) to the nasus, but the latter is also black. At mid-height the pale antehumeral stripe is one-third to one-fourth as wide as the black mid-dorsal, the black humeral 1¼ to 1½ times as wide as the pale antehumeral. The black markings of 8 and 9 are due to the two mid-dorsal stripes, which extend from the base to two-thirds or four-fifths of the length of 8 and to one-half of the length of 9, having fused each with its adjacent inferior lateral black stripe for the first half to three-fifths (on 8) or third (on 9) of the segment's length, while the dorsals have fused with each other for almost their entire length on 8, although only at the extreme base on 9. The inner, or mesial, end of each mesostigmal lamina is produced caudad as a slight carina, parallel to the median sagittal plane of the body, as far as the level of the lower (anterior) forking of the mid-dorsal thoracic carina; this feature is not found in the females referred to *A. botacudo*.

♂♀. Stigma of the front wings surmounting more than one cell (100 per cent. ♂, 66.7 per cent. ♀) or one cell (33.3 per cent. ♀); of the hind wings surmounting more than one (50 per cent. ♂, 83 per cent. ♀), one (33 per cent. ♂, 17 per cent. ♀), or less than one (17 per cent. ♂) cell.

Antenodal cells on the front wings 3 (100 per cent. ♂♀), on the hind wings 3 (100 per cent. ♂, 83 per cent. ♀) or 3 + (17 per cent. ♀).

Postnodals on the front wings 15 (50 per cent. ♂, 33.3 per cent. ♀), 16 (33.3 per cent. ♂, 50 per cent. ♀), 14 (17 per cent. ♂) or 17 (17 per cent. ♀). All percentages based on 3 ♂ 3 ♀.

Dimensions: abdomen ♂ 26–26.5, ♀ 23.5–25; hind wing ♂ 18.5, ♀ 18–19.5 mm.

Habitat: — BRAZIL, Peixe-Boi, by Miss Harriet B. Merrill, 3 ♂ 3 ♀. Academy of Natural Sciences of Philadelphia and coll. E. B. Williamson. Two of the males and one female are accompanied by the following notes made by the collector: ♂ "Bright blue, darker than sky blue Nov. 26, 1907"; ♂ "Entire body blue and black Nov. 26, 1907"; ♀ "Bright blue like larger one Nov. 29, 1907."

After describing the "♀? (Douteuse)" of *Argia impura*, Selys (*l. c.* p. 397) remarks "J'ai été porté à admettre une différence entre *l'impura* et la *tinctipennis* parce que les deux femelles, qui semblent notablement différentes l'une de l'autre, se rapportent parfaitement par les dimensions et le nombre de nervules postcubitales aux mâles que j'y rapporte." The color pattern of abdominal segments 4 and 5 of the males as he describes them would appear to justify the separation of *impura* and *tinctipennis*, but the "notable differences" between the two females do not appear from his description, as the dimensions given for them are exactly alike (abdomen 23, hind wing 19 mm.), and the number of postnodals (postcubitals) for the male of *tinctipennis* is not stated. From the data which are given above for *tinctipennis*, it seems possible that de Selys' *impura* female may also be *tinctipennis*.

58. **Argia chapadæ** sp. nov.

(PLATE IV, FIGS. 76, 76*s*.)

♂. Rear of the head black, with a narrow pale stripe along each eye, margin. Black of the frons not reaching as far down as the level of the first joint of the antennæ, which joint is blue anteriorly; frontonasal suture with a black line. Pale (blue) antehumeral stripe widening from above downward, at mid-height one-half to two-fifths as wide as the black mid-dorsal. Black humeral stripe widened at both ends, at the lower end as wide, at mid-height three-fourths as wide, as the pale antehumeral, forked in its upper fourth or two-fifths, both branches reaching to the upper margin of the sclerite, the mesepimeral branch noticeably curving backward (caudad) to attain also the upper end of the obsolete first lateral thoracic suture. A narrow black stripe on the entire length of the second lateral thoracic suture or obsolete on the lower half thereof. Abdominal segment 2 blue, a black stripe on each side from end to end of the segment, curving mesad just in front of its hind end toward, but not meeting, its fellow of the opposite side on the dorsum; side below this stripe blue, unmarked; the dorsal blue of the anterior part of the segment two-thirds to four fifths as wide as the segment itself; 3–6 predominantly blue in dorsal view, each with a longitudinal black stripe on each side beginning just behind the usual transverse basal blue ring and widening to meet its fellow of the opposite side on the dorsum in the hindmost fifth or sixth of each segment (or in some the fourth of 6); 7 black with a narrow transverse basal blue ring, mid-dorsally interrupted with black; inferior lateral margins of 3–7 blue, except in the hindmost sixth of each segment; 8–10 blue, with an inferior black stripe on each side as long as the segments.

♀. A single female seems to belong to this species. It differs from the male as follows: Nasus black, a small pale spot on each side, black of the frons reaching down between the antennæ to the level of their bases (first antennal joint remaining pale anteriorly) and connected by a median perpendicular black line with the black of the nasus; black humeral stripe similar to that of the male, but not so narrow in its middle where it is subequal in width to the pale antehumeral, the black stripe obsolete on the lower half, or more, of the second lateral thoracic suture; dorsal blue of the anterior part of abdominal segment 2 narrower, one-half to one-third as wide as the segment; 3–5 predominantly black in dorsal view, the lateral black stripes wider, so that the mid-dorsal blue is reduced in width to one-third of that of the segment on 3 and 4 and to hardly more than a line on 5, and not confluent with the transverse basal blue ring on 4 and 5, as the ring is mid-dorsally interrupted with black; 6 like 7 of the male; 8 and 9 similar to those of the male, but having in addition a pair of black dorsal stripes extending from the base of each segment to three-fourths of 8, three-fifths of 9, each dorsal fused with its adjacent inferior lateral for the first half of 8 or third of 9, and with its fellow dorsal at the extreme base of 8, but not on 9; hind ends of the dorsals narrower and rounded; 10 blue, with a transverse basal black line, posterior dorsal margin of the segment narrowly cleft on the median line almost to the base of the segment. Prothorax and mesostigmal laminæ lost.

♂♀. Stigma of the front wings surmounting more than one (55 per cent. ♂, right wing ♀) or one (45 per cent. ♂, left wing ♀) cell; of the hind wings surmounting more than one (50 per cent. ♂, left wing ♀), one (45 per cent. ♂, right wing ♀), or less than one (5 per cent. ♂) cell.

Antenodal cells of the front wings 3 (80 per cent. ♂, and ♀) or 3 + (20 per cent. ♂), of the hind wings 3 (100 per cent. ♂, ♀) The percentages are based on 10 ♂.

Dimensions: abdomen ♂ 25.5–26, ♀ 24; hind wing ♂ 18–20, ♀ 19 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 2 ♂ and parts of 9 others, 1 ♀. Carnegie Museum, Pittsburgh.

This species is very similar to *A. tinctipennis* Selys and may be a subspecies (geographical race) thereof, but the intermediates are not at hand. The chief differences are that *A. tinctipennis* has the black of the frons extending down to the nasus; the black humeral stripe of uniform width (not narrower in the middle, as in *chapadæ*), wider in that it extends over the whole of the mesepimeron (instead of reaching to the obsolete first lateral thoracic suture at its upper end only), and not forked, although enclosing a pale dot at its upper end; the black stripe on the second lateral thoracic suture wider and complete. In *tinctipennis* ♀, in addition, the mid-dorsal blue on abdominal segments 3 and 4 is a mere fine line, while in *chapadæ* ♀ it forms a stripe of some width. The wings of the present material of *chapadæ* are only very slightly yellowish, or smoky, but this may be only an age-difference, as de Selys accepts it as such in his description of *tinctipennis*.

59. **Argia botacudo** sp. nov.

(PLATE IV, FIGS. 63, 77, 77*s*.)

♂. Rear of the head black, a narrow yellow stripe along each eye-margin. Pale antehumeral stripe at mid-height two-fifths as wide as the black mid-dorsal. Black humeral stripe of subuniform width, one and one-half times as wide as the pale antehumeral, not forked, but enclosing a very small pale spot at its upper end. A black stripe on the entire length of the second lateral thoracic suture. Abdominal segment 2 violaceous, a longitudinal black stripe on each side from end to end, approaching, but not meeting, its fellow of the opposite side on the dorsum a little in front of the hind end of the segment, the violaceous area on the anterior dorsal part of the segment half to three-fifths as wide as the segment itself, the lateral black stripe reaching down to the inferior margin at mid-length of the segment and again at the hind end, or for most of the posterior part of the segment. Abdominal segments 3 and 4 chiefly violaceous in dorsal view, each having a lateral black stripe on each side beginning just behind the usual transverse pale basal ring and widening on the hindmost fourth to sixth of the segments to meet its fellow of the opposite side on the dorsum; segment 5 similar, but since the lateral black stripes meet on the hindmost third or fourth of the segment, and the mid-dorsal violaceous is narrower and tapers to a more acute point posteriorly, black predominates on this segment in dorsal view; 6 and 7 black with a narrower transverse pale basal ring; inferior lateral margins of 3–6 or 7 pale yellowish, or brownish, except in the hindmost fifth of each segment; 8–10 violaceous, with an inferior black stripe each side as long as the segments, and apparently reaching farther up toward the dorsum at the hind end of 8 than at any other point.

♀. Differs from the male as follows: Nasus black with a small pale spot on each side; the black of the frons extends to the nasus in one specimen only (in the males the nasus is blue, the fronto-nasal suture, the rhinarium, and the base of the labrum are narrowly black); pale antehumeral stripe one-fourth to two-fifths as wide as the black mid-dorsal at mid-height, black humeral stripe nearly twice to one and one-half times as wide as the pale antehumeral; the violaceous area on the anterior part of the dorsum of abdominal segment 2 reduced in width to about one-third of that of the segment, the lateral black stripe not reaching to the inferior margin, but there is an elongated isolated brown spot on the posterior half of the yellowish side of the segment; 3 and 4 chiefly black, the mid-dorsal pale stripe much reduced in width, although of about the same length; 5–7 black, with a mid-dorsal pale line from base backward (caudad) to five-sixths (on 5) or one-half (on 7) of the length of the segments; 8 and 9 with black predominating in the form of four longitudinal stripes, two dorsal, and an inferior on each side, all four reaching from end to end of segment 8 (or the two dorsals interrupted at three-fourths' length), all four fused at base and at apex, the basal fusion between each lateral and its adjacent dorsal extending for the anterior two-thirds of the segment; on 9 the inferior lateral black stripes reach from end to end of the segment, the dorsals from base to two-thirds of the length, each dorsal being fused with its adjacent lateral for the basal half or third of the segment, but with its fellow dorsal only at the extreme base; 10 pale, with a narrow transverse basal black stripe, the posterior margin of the segment cleft mid-dorsally and narrowly for almost the whole length of the segment.

♂♀. Stigma of the front wings surmounting more than one (75 per cent. ♂, 83 per cent. ♀) or one (25 per cent. ♂, 17 per cent. ♀) cell; of the hind wings surmounting more than one (85 per cent. ♂, 66.7 per cent. ♀) or one (15 per cent. ♂, 33.3 per cent. ♀) cell.

Antenodal cells on the front wings 3 (80 per cent. ♂, 100 per cent. ♀) or 4 (20 per cent. ♂); on the hind wings 3 (100 per cent. ♂, 83 per cent. ♀) or 2 (17 per cent. ♀). Percentages based on 10 ♂, 3 ♀.

Dimensions: abdomen ♂ 24–26.5, ♀ 23.5; hind wing ♂ 18–19.5, ♀ 19–20 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 5 ♂ (and parts of 10 others), 2 ♀ (and parts of 1 other), 1 ♂ 1 ♀ each numbered 85, other males numbered 83 and 149, females 78 and 188 by the collector. Carnegie Museum, Pittsburgh.

The specific name proposed is that of a tribe of Brazilian Indians.

The postocular spots of both sexes of this species are rather distinctive, being smaller than is often the case in this genus, not so elongate mesad, and with no pale transverse occipital stripe between the right and left spots.

60. **Argia tupi,** sp. nov.

(PLATE IV, FIGS. 78, 78*s*.)

♂. Rear of head chiefly black, a narrow yellowish stripe bordering each eye and a narrow transverse superior yellowish stripe each side immediately behind the black, which borders posteriorly each pale post-ocular spot, the yellowish stripe subequal in width to this black. Pale (violet) antehumeral stripe twice as wide as the black mid-dorsal. Black humeral stripe a mere line in its upper two-thirds, but widened at its upper end, in its lower third confluent with an oblique black mesepimeral stripe. This latter stripe reaches to the upper margin of the mesepimeron; in its lower third it is half, or a little more than half, as wide as the pale antehumeral. A black stripe on the whole length of the second lateral thoracic suture. Abdominal segment 2 violet on dorsum bounded on each side by a black stripe, which is widened mesad at three-fourths' length and again narrowed before the hind end of the segment, but does not meet its fellow of the opposite side; sides of 2 below this stripe yellowish, with the posterior two-thirds of the inferior margin black; 3–6 violet, with a black stripe on each side beginning shortly behind the base of each segment and reaching to the hind end and widened mesad to meet its fellow of the opposite side in the hindmost fifth of 3, fourth of 4, two-fifths of 5, half of 6; 7 black, with a narrow transverse basal pale ring; the lateral black of 3–7 encloses a longitudinal pale brownish or yellowish stripe the length of which may be half, or more than half, of that of the segment; 8–10 pale (blue?) with an inferior black stripe on each side for the entire length of each segment.

Stigma of the front wings surmounting more than one cell; of the hind wings surmounting more than one cell (75 per cent.), two cells (12.5 per cent.) or more than two cells (12.5 per cent.).

Antenodal cells on the front wings 4 (87.5 per cent.) or 4 + (12.5 per cent.), on the hind wings 4 (87.5 per cent.) or 3 + (12.5 per cent.). (Percentages here and in preceding paragraph based on 4 ♂.)

♀ unknown.

Dimensions: ♂. Abdomen 29.5–33.5; hind wing 23–26 mm.

Habitat: — Brazil, Chapada, by H. H. Smith, 4 ♂, one dated May. Carnegie Museum, Pittsburgh.

The specific name proposed is that of a native human tribe.

This species belongs to the same group as the Mexican and Central American species *harknessi*, *barretti*, *pipila*, and *chelata* of the "Biologia Centrali-Americana," Volume Neuroptera, and in the key to the species therein (*l. c.* pp. 71, 359) comes nearest to *chelata*. It differs from *chelata* in its smaller size, fewer antenodal cells on the front wings, in the details of the abdominal appendages, the smaller extent of pale color (here violet) on the abdomen, the black humeral stripe forked in its upper two-thirds, the mesepimeral constituent of the fork reaching to the upper margin of the mesepimeron, which is not the case in *chelata*.

Among the described South American species, *tupi* seems to approach *claussenii* Selys and *croceipennis* Selys. From the description of the first it appears to differ by the absence in all four examples of any double cells in the second cubital area (= espace postcostal of de Selys), in having fewer black bands on the thorax, and less pale color on the abdomen, especially on segment 7; the details of the abdominal appendages are also different from Hagen's figures of those of *claussenii*. (Bull. Mus. Comp. Zoöl. XXXIX, 1902.)

The description of *croceipennis* calls for an insect having, *inter alia*, its wings "entièrement lavées de jaunâtre safrané, . . . devant du thorax noir, avec une bande antéhumérale bleue arquée [which I interpret to mean that black predominates on this area]. . . . Abdomen noir luisant, marqué de bleu ainsi qu'il suit: . . . 7me–8me à anneau basal non prolongé," which characteristics appear to exclude the form here described as new.

61. **Argia subapicalis** sp. nov.

(Plate IV, figs. 79, 79*s*.)

♂. Rear of the head black, a pale stripe bordering the eyes below; one ♂ shows also a superior transverse yellowish stripe similar to that described for *A. tupi*. Black mid-dorsal thoracic stripe reduced to a line upon the carina only. Black humeral stripe little more than a line for most of its length, slightly wider in its upper half, especially just below its upper end, at its lower end confluent with a subquadrangular mesepimeral black spot, similar to, but wider than the spot in the same area in *A. apicalis* Say of North America, and which is continued upon the mesinfraepisternum. A black stripe on the second lateral thoracic suture down to the level of the metastigma. Abdominal segment 2 blue, becoming violet with age, with a black stripe on each side from end to end, widened mesad at about four-fifths' length, so as to approach, but not to meet, its fellow of the opposite side on the dorsum, and again narrowed to the hind end; 3–7 predominantly black, with a narrow transverse basal pale (violet in older examples) ring, which on 3 is produced backward on the dorsum, tapering posteriorly to four-fifths or two-thirds of the segment's length, and on 4 is similarly produced for the first eighth or tenth of the segment's length; on the sides of 3–6 or 7 the pale basal ring is produced as a pale stripe along the inferior margin to about five-sixths of the length of each segment; 8–10 pale (blue?) with an inferior black stripe on each side as long as the segments; in at least one specimen the black stripe on each side of 8 is produced upon the dorsum at the hind end of the segment, and meets its fellow of the opposite side.

Stigma of the front wings surmounting more than one (60 per cent.), one (20 per cent.) or less than one (20 per cent.) cell, long; of the hind wings surmounting more than one (50 per cent.), one (40 per cent.), or less than one (10 per cent.) cell.

Antenodal cells on the front wings 4 (90 per cent.) or 5 (10 per cent.), on the hind wings 4 (80 per cent.) or 5 (20 per cent.). (Percentages in this and in the preceding paragraph based on 5 ♂.)

♀ unknown.

Dimensions; ♂. Abdomen 28–31.5; hind wing 19–23 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♂ and parts of 2 others. Carnegie Museum, Pittsburgh.

This species shows a remarkable resemblance to *A. apicalis* Say of North America, which latter is not known south of Texas. *Apicalis* differs in the following peculiarities: the rear of the head is chiefly pale; the black on the upper surface of the head extends no farther forward on the middle line than the median ocellus, and the first antennal joint is pale (blue), (in *subapicalis* the black of the upper surface of the head reaches at least as far forward along the median line as the anterior limit of the antennal bases, and is in some examples produced as far as the fronto-nasal suture, and the first antennal joint is black); there is no black stripe on the second lateral thoracic suture, the mid-dorsal longitudinal pale area on abdominal segment 2 is merely a narrow stripe (in *subapicalis* it is nearly as wide as the segment, when seen in strictly dorsal view), there is a pale blue or yellow mid-dorsal longitudinal line or narrow stripe, which does not taper, on 3–6 reaching from the transverse basal ring to three-fourths or more of the length of each segment; the superior abdominal appendages are shorter, both absolutely and relatively, the inferior appendages have the branches of the bifid apex less divergent and of equal length.

62. **Argia iralai**, sp. nov.

(Plate IV, fig. 65.)

♀. Rear of the head yellowish, a small black streak on each side of the occipital foramen, anterior surface of the first, and of part of the second antennal joints pale (ochreous), black of the frons not reaching down as far as the base of the antennæ, a black line on the fronto-nasal suture. Pale antehumeral stripe at mid-height very slightly wider than half to three-fifths as wide as the mid-dorsal black. Black humeral stripe at mid-height half as wide as the pale antehumeral, slightly forked, or not so at its lower end, forked in its upper three-fifths to two-fifths, humeral branch mostly linear, mesepimeral branch wider, curved backward (caudad) at its upper end to reach the short black line on the upper end of the obsolete first lateral thoracic suture. Second lateral suture with a black line on its upper part, or all the way down to the metinfraepisternum. Dorsum of abdominal segment 2 violet, with a black stripe on each side as long as the segment, widening mesad before the hind end of the segment, but not meeting its fellow of the opposite side on the dorsum, and again narrowing to its hind end; dorsal violet at its widest half as wide as the segment itself; side below the black stiipe yellowish, without distinct dark markings. Segments 3–7 black, with a narrow transverse pale basal ring confluent with a pale mid-dorsal narrow stripe on 3–5, or line on 6, nearly as long as each segment; sides of 3–7 inferiorly pale, except for a blackish spot at the hind end of each; 8 with a wider dorsal and a narrower inferior longitudinal black stripe on each side, all as long as the segment, the two dorsals nearer to each other than either is to the adjacent inferior, confluent with each other anteriorly, but not with the inferiors; 9 similarly marked except that the two dorsals reach only to two-thirds of the segment's length, and are not confluent, the inferior stripe may be broken into spots; 10 pale, with only a small basal lateral black spot.

Wings pale brownish-yellow, stigma surmounting more than one cell (83.3 per cent. of both front and hind wings).

Antenodal cells on the front wings 4 (83.3 per cent.) or 5 (16.7 per cent.), on the hind wings 4 (100 per cent.). Percentages based on 3 ♀.

Dimensions. Abdomen 27–29; hind wing 23–24 mm.

♂ unknown.

Habitat: — PARAGUAY, Sapucay, by W. T. Foster, November, 1899, three females, two of them numbered 16, the third 20 by the collector (others numbered 16 are *Argia fosteri*). U. S. National Museum.

The specific name is in honor of Domingo Irala, founder of Asuncion.

The mesostigmal lamina of this species is fairly large and strong, its inner (mesial) end continued as a flattened ridge, which is directed caudad, lies external to the fork of the lower (anterior) end of the mid-dorsal thoracic carina, and gradually merges with the mesepisternal surface anterior to the level of the forking of the mid-dorsal carina; the lamina itself is almost exactly transverse and its crest is largely yellowish; the continuation of the lamina as described above is paralleled in the female of *A. tinctipennis*, *q. v.*

A mesostigmal lamina very similar to that of *iralai*, except that it is entirely black, is found in a female from Cachoeira, Brazil, by H. H. Smith (no. 27), in the Carnegie Museum. This female, which may be merely an older individual of *iralai*, has the black of the frons reaching to the level of the antennæ-bases, second antennal joint black anteriorly, nasus obscure blackish, dorsal violet of abdominal segment 2 narrower, an inferior longitudinal brown or black line extending forward from the blackish spot at the hind end of 3–7 almost to base, dorsal black stripes on 9 confluent at anterior end of the segment.

Abdomen 26, hind wing 21.5 mm.

DIARGIA, gen. nov.

Biserial hairs or spines of the basal halves of the second and third tibiæ twice as long as the intervals separating them, tarsal nails with an inferior tooth. Vein A (= inferior sector of the triangle of de Selys*) separating from the hind margin of the wing at least as far proximad to the cubito-anal cross-vein (= postcostal cross-vein of de Selys) as the latter is long. Arculus at the second antenodal. Quad-

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* Cf. Biol. Centr.-Amer. Neurop. p. 133, footnote †.

rilateral on the front wings with the anterior side less than half as long as the posterior side, on the hind wings the anterior side more than half, or half, as long as the posterior side. M_2 (= nodal sector of de Selys) arising nearest the fifth postnodal on the front wings, the fifth or fourth on the hind. Pterostigma and venation similar on front and hind wings in both sexes. Abdominal appendages of the male similar to those of *Argia i. e.* the superiors transversely, the inferiors vertically, bifid. No ventral posterior spine on abdominal segment 8 of the female.

Type: *Diargia bicellulata,* sp. nov.

This genus is closely related to *Argia* from which it differs in the smaller number of biserial tibial hairs or spines (5–6 on outer side of third tibia), the more proximal origin, as measured by number of postnodals, of vein M_2 and, in so far as the only known species is concerned, by possessing but *two* antenodal ultraquadrilateral cells. From *Argiallagma* Selys (*cf.* Calvert, Biol. Centr.-Amer. Neurop., p. 376) it differs by the argiaform appendages of the male, the absence of a vulvar spine in the female, and by the smaller number of antenodal cells.

Of the species of *Argia* known to me, *Diargia* most closely approaches *Argia thisma,* described as new in the present paper, page 141, under which heading will be found some details for comparison with *Diargia bicellulata.*

63. **Diargia bicellulata,** sp. nov.

(PLATE IV, FIGS. 67, 68, 68*s*; PLATE VIII, FIG. 141.)

♂. *Black* with the following parts *pale yellow* or *blue*: first antennal joint anteriorly and all of the face and lips below the level of the second joint of the antennæ, a cuneiform postocular spot on each side and a transverse occipital line connecting them, a narrow line bordering the eyes posteriorly, front lobe of the prothorax and the sides of the other two lobes, an antehumeral stripe which at mid-height is one-sixth as wide as the black mid-dorsal, a metepisternal stripe and a metepimeral stripe, neither of which is quite as wide as the black humeral (mesepimeral) stripe, or as the black stripe present on the entire length of the second lateral thoracic suture, an oval dorsal (blue) spot on abdominal segment 2, a narrow transverse basal ring on 3–7 confluent with a mid-dorsal line or narrow stripe on 3–5 or 6, reaching the greater part of the length of each segment, sides inferiorly of 3–6 in the anterior two-thirds of each, femora inferiorly, tibiæ superiorly. Abdominal segments 8 and 9 blue, with an inferior black stripe on each side occupying the greater part of the length of each segment. Hind margin of abdominal segment 10 with a mid-dorsal excision. Superior appendages not quite as long as 10, extreme apex bifid transversely, inner branch longer. Inferior appendages a little longer than 10, vertically bifid, upper branch the longer and more robust, directed upward; lower branch shorter, slenderer, more acute, directed backward (caudad).

Younger males differ from the above description in having the markings of abdominal segment 2 more distinctly argiaform, in that there is a superior black stripe on each side contracting posteriorly to three-fifths its length, thence widening to its hind end, not reaching the hind margin of the segment, and failing to unite with its fellow of the opposite side; each side has also an inferior black stripe; the black on the first three-fourths of segments 3 and 4 represented by ill-defined brownish markings.

Old males differ from the first description in having a black line on the fronto-nasal suture, a couple of black dots on the rhinarium, a mid-basal black mark on the labrum; the sides and ventral surface of the thorax and the first two abdominal segments show more or less pruinosity; segments 3–6 show some tendency to have the inferior lateral margin blackish ventrad to the pale coloring.

♀. The only example of this sex has the head and abdominal segments 3–6 marked as above described for the old males; segment 2 black dorsally with a very small median blue spot, sides pale yellow with an inferior longitudinal black stripe; 7 similar to 6; 8 pale posteriorly, its black marks consisting of a pair of dorsal stripes reaching from the base backward to two-thirds of the segment's length, confluent with each other for the first third, and each with an adjacent inferior lateral black stripe for the first half of the segment's length; the inferior lateral black stripe extends the whole length of the segment. Segment 9 black, with a single mid-basal, and on each side at three-fourths' length a posterior pale dot; 10 black, its hind margin narrowly pale, cleft mid-dorsally to base, appendages shorter than the segment, black; no vulvar spine.

♂♀. Wings uncolored, iridescent, veins pale reddish at base, darker distally; stigma brown, costal side onlyslightly longer than the proximal ordistal sides, which are subparallel, surmounting usuallyone cell. Front wings with 9–12 postnodals (10, 40 per cent. and 11, 35 per cent., more frequently), M_2 (= nodal sector of de Selys) arising nearest the fifth (80 per cent.) or sixth (10 per cent.) postnodal, or midway between (10 per cent.); two (90 per cent.) or three (10 per cent.) antenodal ultraquadrilateral cells. Hind wings with 7–10 postnodals (11, 55 per cent. most frequently); M_2 arising nearest the fifth (45 per cent.), fourth (40 per cent.), or midway between (10 per cent.), or in one wing (= 5 per cent.) nearest the sixth postnodal; two (95 per cent.) or three (5 per cent.) antenodal ultraquadrilateral cells. All percentages based on 9? ♂ 1 ♀.

Dimensions. Abdomen ♂ 16.5–20, ♀ 18.5; hind wing ♂ 11.5–13.5, ♀ 14.5.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 8 ♂ 1 ♂ and parts of 2 other specimens, some labeled 145, one 77, by the collector. Carnegie Museum, Pittsburgh.

64. **Leptagrion porrectum ?**

Leptagrion porrectum Selys, Bull. Acad. Belg. (2) xlii, p. 975. 1876.

L. porrectum Selys was described "d'après un exemplaire" from Brazil. The description is in one place,[17] at least, obscure. A male from Rio de Janeiro, in November, by H. H. Smith (Carnegie Museum, Pittsburgh), resembles that description in many respects, but differs in others, so that I am uncertain whether it pertains to the same species or not. The differences are: the longer abdomen 64 mm. (instead of 54), 13 postnodals on the front wing (instead of 14–15), upper surface of the head blue, but with a transverse blackish band .5 mm. wide from eye to eye, the median ocellus and the bases of the antennæ being respectively on the upper and lower margins of this dark band, the first antennal joint having a blue spot anteriorly; hind prothoracic lobe blue, with a reddish spot in the middle; neither the mid-dorsal thoracic carina nor a "juxta-humeral" ray black, only a short black line at the upper ends of the humeral and of the second lateral sutures; a blue antehumeral stripe bordering the humeral suture anteriorly, one-third as wide as the reddish mid-dorsal; abdomen pale ochre-brown, sides of 1 and 2 pale green, extreme base and an anteterminal transverse band of about 1 mm. in width on 3–6 blackish or dark brown, on 3 and 4 this anteterminal band is distinctly separated from the hind end of the segments by a narrower pale ochre ring; 7

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[17] *L. c.*, p. 976, lines 25–27.

obscure brownish, 8–10 obscure, possibly pale blue or green in life; superior appendages very slightly longer than 10, 1 mm. long, dark brown; in dorsal view each is about three times as long as wide at base, inclined slightly toward each other, more especially in the distal two-fifths, apex rounded, obtuse; in profile view each superior appendage tapers somewhat from base to the obtuse apex, which bears a rather thick tuft of pale brownish-yellow hairs; at mid-length is an inferior process divided into two branches both directed inward (mesad) and downward (ventrad), the anterior branch also somewhat forward, the posterior branch also hindward (caudad), the anterior branch shorter, slenderer, subcylindrical, the posterior lamellate and expanded at its tip; 7 spines ("cils") on the outer row of the third tibia.

If the appendages of this insect are the same as of Selys' *porrectum*, I think it likely that only one species is concerned in spite of the very considerable color differences, for these latter are not greater than are to be found in that protean form, *Telagrion fulvellum*. If our present male proves to be distinct, the name *perlongum* would be appropriate. Like *porrectum* it is "roussâtre clair . . . à la place ou seraient les taches postoculáires non délimitées en arrière," and it is difficult to see why de Selys did not refer *porrectum* to *Telagrion* instead of to *Leptagrion*.

65. **Leptagrion macrurum** Burmeister.

Habitat: — BRAZIL, Rio de Janeiro, by H. H. Smith, November, 1 ♂ and part of one other, December, 1 ♂, parts of 2 ♀. Carnegie Museum, Pittsburgh. Rio de Janeiro, by Reinhart, 1 young ♂; Lagoa Santa [in Brazil?], Lund, 1 ♀; Museum of Comparative Zoölogy, Cambridge, Mass.

There are nine spines on the outer row of the third tibia. Young ♂♀ have the head pale above, including the area occupied by the pale postocular spots of other genera, a black stripe on the occiput, no mid-dorsal thoracic black.

66. **Leptagrion elongatum** Selys.

Habitat: — BRAZIL, Rio de Janeiro, in November, by H. H. Smith, 1 ♂, 1 ♀ and part of one other. Carnegie Museum, Pittsburgh.

67. **Enallagma civile** Hagen.

Enallagma civile Calvert, Biol. Centr.-Amer. Neurop., pp. 110, 380. 1902, 1907.

Habitat: — JAMAICA, Hope Gardens, May 29, 1904, by W. R., Maxon, 8 ♂. U. S. National Museum.

Not previously recorded from Jamaica, although known from Cuba, Hayti, and Porto Rico.

68. **Enallagma cœcum novæ-hispaniæ** Calvert.

Enallagma cœcum novæ-hispaniæ Calvert, Biol. Centr.-Amer. Neurop. p. 381. 1907

Habitat: — COLOMBIA, Bonda in Dept. Magdalena, August, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

69. **Enallagma ovigerum** sp. nov.

(PLATE VI, FIGS. 123, 123*s*.)

♂. Dorsal surface of the head blackish, the following *blue*: a large postocular spot each side, lower margin of the frons, genæ, rhinarium, external surfaces of mandibles and labrum. Labrum and rear of head cream-color, or very pale blue. Prothorax obscure blackish, sides and perhaps the front lobe pale blue; hind lobe produced upward as a median quadrangular process, the width of which is greater than its height. Mesothoracic dorsum blackish-brown, a pale blue antehumeral stripe the width of which at mid-height is about one-third of that of the dark mid-dorsal band and somewhat narrower than the humeral stripe, which latter is dark reddish-brown; sides and ventral surface pale blue.

Dorsum of abdominal segments 1–6 black, their sides inferiorly pale blue, green, or yellow, 3–6 also with a narrow transverse basal mid-dorsally interrupted pale ring; 7 chiefly pale blue, with a transverse black band at anterior and at posterior ends, the latter wider, and an inferior lateral longitudinal black stripe on each side connecting the two transverse bands; 8 and 9 blue, 10 black dorsally, ventral surfaces of 1–10 pale blue, or yellow. Hind margin of 10 with a mid-dorsal bilobed process, the height of which is about one-tenth of that of the segment, and which is quite distinctly marked off from the rest of the segment, as seen in profile view, by a slight constriction as its base.

Superior appendages not quite as long as 10, quite complicated, blackish; in dorsal view diverging from each other, each bifid at tip, with outer and inner branches, the latter reaching farther caudad. In profile view three divisions of the distal part of the appendage are visible, two outer and one inner between the other two; of the two outer, one is above the other, being the outer branch of the dorsal view, and is separated from the lower outer branch by a regular concave curve, within which the inner branch of the dorsal view appears. From the ventral surface of the inner branch projects downward a strong acute spine, which is curved anteriorly (cephalad) at its tip; this spine is concealed by the inferior appendage of the same side of the body, lying laterad to it in an ordinary profile view. Inferior appendages shorter than the superiors, higher than long in profile view, upper edge produced backward (caudad) and slightly upward to an acute apex, which reaches beyond the level of the rounded postero-inferior angle of the appendage, distal edge concave.

Legs obscure brown, femora darker, 7–8 spines on the outer row of the third tibia.

Wings uncolored, stigma dark brown, surmounting one cell, its costal edge very little longer than the proximal or distal edges; three antenodal ultraquadrilateral cells on all wings, anal vein (= inferior sector of the triangle of de Selys) parting from the hind margin proximal to the cubito-anal (= basal postcostal of de Selys) cross-vein on the front wings by a distance almost as great as the length of the cross-vein itself, on the hind wings by a distance distinctly less than the length of the cross-vein. Front wings with 12–13 postnodals; M_2 (= nodal sector of de Selys) arising at the fifth. Hind wings with 10–11 postnodals; M_2 arising at the fourth.

Abdomen 30, hind wing 20.5 mm.

♀ unknown to me.

Habitat: — COLOMBIA, Santa Fe de Bogota, by Lindig, 1863, 1♂. Museum of Comparative Zoölogy, Cambridge, Mass.

The specific name is a manuscript name of Hagen's, under which this specimen and a number of others have stood for many years. These other specimens, male and female, are, with one exception, very immature, and the males have lost the hind end of the abdomens. A mature female differs in the shape of the pterostigma and in a number of details of the venation. Taking these defects and differences into consideration, I am very doubtful whether these other specimens also belong to *ovigerum*.

Genus ACANTHAGRION.

The following synopsis will assist in the identification of the species of the typical group of this genus, the group of *gracile* Rambur, which agree in having the anal vein (= inferior sector of the triangle of de Selys) parting from the hind margin of the wing at, or distal to (*not* proximal to) the cubito-anal cross-vein (= basal postcostal of de Selys) on all the wings.

MALES.

1. *Superior appendages as long as, or longer than, the inferiors.*

A. Superior appendages directed downward (ventrad) as well as caudad, not curved up at tip, and projecting only a slight distance beyond the level of the superiors.

B. Pale postocular spots not confluent with the pale color of the rear of the head.

C. Costal side of stigma of front and hind wings longer than the proximal or distal sides.

D. Dorsum of abdominal segment 2 blue, with a black lance-head spot pointed anteriorly, but not reaching the anterior end of the segment. *gracile lancea.*

DD. Dorsum of abd. seg. 2 black for its entire length.

E. Inferior appendages but slightly, if at all, upcurved at the tip.

F. Abdominal segment 10 not more than one-and-one-fourth (1¼) times as high in profile view as segment 9 at base.

G. Superior appendages not widened at apex.

H. Dorsum of abd. seg. 7 black, but its hind end blue. *gracile.*

HH. Dorsum of abd. seg. 7 black, including its hind end.

J. Black humeral stripe wider than, or as wide as, the pale blue antehumeral. *gracile minarum.*

JJ. Black humeral stripe represented only by small black marks at upper and lower ends of humeral suture, the antehumeral blue therefore widely confluent with the blue of the side of the thorax. *gracile ablutum.*

GG. Superior appendages widened at apex. *latapistylum* [18]

FF. Abd. seg. 10 one-and-one-third to one-and-one-half (1⅓–1½) times as high in profile view as segment 9 at base; apex of dorsal process of 10, as seen in end view, not half as wide as the maximum width of 10 itself, very slightly bifid; pale colors of upper surface of head and of thorax pale blue, abd. seg. 7 blue at hind end. *gracile ascendens.*

FFF. Abd. seg. 10 twice as high in profile view as seg. 9 at base; apex of dorsal process of 10, as seen in end view, almost as wide as the maximum width of 10 itself, deeply bifid, branches diverging, each branch subacute at tip; pale colors of upper surface of head and of thorax orange-red, abd. seg. 7 black throughout. *apicale.*

EE. Inferior appendages strongly upcurved at tips, abd. seg. 7 black. *cuyabæ* and subspecies (for their differences see *postea*).

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[18] Calvert, Anales Mus. Nac. Buen. Ayres, vii, p. 26, figs. 1–3. 1899. Paraguay.

CC. Costal side of stigma on the hind, and often also on the front, wing shorter than the proximal or distal side, inferior appendages strongly upcurved at tips, dorsum of 2 and of 7 black. *truncatum.*

BB. Pale postocular spots confluent with the pale color of the rear of the head; superior appendages with an anteterminal constriction in profile view, inferior appendages but slightly, if at all, upcurved at tips, dorsum of 7 black. *temporale.*

AA. Superior appendages directed caudad, but not ventrad, curved up in the distal half, projecting caudad twice as far as do the inferior appendages.

K. Each postocular spot one-third as wide as the distance from eye to eye, and touching the eye-margin, second lateral thoracic suture with a short black mark at its upper end only, dorsum of 2 chiefly blue with a triangular black spot on its middle, dorsal black of 3–5 pointed anteriorly, 10 blue dorsally. *chararum.*

KK. Each postocular spot one-fourth to one-fifth as wide as the distance from eye to eye and not touching the eye-margin, second lateral thoracic suture with a black stripe reaching from the upper end two-thirds of the way down to the metastigma, dorsum of 2 chiefly black with only a narrow transverse basal blue ring, dorsal black of 3–5 almost rounded anteriorly, 10 black dorsally. *chacoënse.*

2. *Superior appendages distinctly shorter than the inferiors.*

L. Nasus and dorsum of prothorax black, a black humeral stripe (interrupted or not interrupted superiorly), an interrupted black stripe on the second lateral thoracic suture, abd. segs. 2 and 3 chiefly black, 2 with a posterior terminal transverse pale band, 3 with a narrow basal pale ring, 8 and 9 blue with a lateral longitudinal black stripe on each side. (From de Selys' description.) *trimaculatum.*

Nasus and prothorax entirely blue, a very short black line on the upper ends only of the humeral and second lateral thoracic sutures, abd. segs. 2 and 3 chiefly blue, 2 with an isolated transverse black stripe at three-fourths' length, 3 with hindmost sixth black, 8 and 9 blue without black markings. *chirihuanum.*

FEMALES.

A. Postocular spots not confluent with the pale color of the rear of the head.

B. Black humeral stripe complete.

C. Abdominal segments 9 and 10 (and in some also the hind end of 8) blue, 9 with a basal black spot on each side. Size larger, abd. 23–27, hind wing 17–18 mm. *gracile, latapistylum.*

CC. Abdominal segments 9 and 10 black dorsally.

D. Size larger (abd. 23, hind wing 16 mm.). *gracile minarum.*

DD. Size smaller (abd. 19–20, hind wing 13–15 mm.). *truncatum.*

BB. Black humeral stripe represented only by a short black line on the upper end of the humeral suture and a brown spot at its lower end, 8–10 as in *gracile.* *gracile ablutum.*

AA. Postocular spots confluent with the pale color of the rear of the head, abd. segs. 9 and 10 blue, 9 with a triangular basal black spot on each side, abd. 20–21, hind wing 14–15 mm. *temporale*

(The females of the other species are unknown.)

70. **Acanthagrion gracile** Rambur.

Acanthagrion gracile Calvert, Biol. Centr.-Amer. Neurop. pp. 115, 382, pl. v, fig. 20. 1902, 1907.

VENEZUELA, Caracas, by R. M. Bartleman, 1 ♀. U. S. National Museum.

Habitat: — BRAZIL, Bom Fim, State of Bahia, at a small pond in city, November 2, 1907, 2 ♂, and at Fazenda de Amaratu, Nov. 21, 1907, 1 ♂, 1 ♀, by J. D. Haseman; Rio de Janeiro, November, 3 ♂ and parts of 2 others, and Desterro, part of 1 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

São Sebastião, November 1, 1900, by A. Hempel, 1♂ 1♀. Academy, of Natural Sciences, Philadelphia.

PARAGUAY, Sapucay, January 27, 1903, by W. T. Foster, 1 ♀ with males of *gracile minarum*. U. S. National Museum.

ARGENTINA, Sta. Helena, east side Rio Paraná, December 21, 1 spmn., by H. H. Smith. Carnegie Museum, Pittsburgh.

71. **Acanthagrion gracile minarum.**

Acanthagrion gracile race? *minarum*, Selys, Bull. Acad. Belg. (2) xli, p. 309. 1876.

In the Biologia Centrali-Americana, Neuropt., p. 382, record is made of specimens from Central America having abdominal segment 7 black at the hind end, consequently resembling *gracile minarum*. Comparing what on inspection seemed to be average specimens with 7 so colored, I obtained the following measurements in millimeters:

	Surubres, Costa Rica.	Gualan, Guatemala.	Chapada, Matto Grosso.
(1) Width of head.	3.16	3.36	2.48
(2) Width of one pale postocular spot, measured at right angles to longitudinal axis of body.	.6	.5	.36
Ratio of (2) to (1).	.19	.148	.145
(3) Maximum height of abdominal segment 10 in profile view.	1.28	1.2	.88
(4) Height of abdominal segment 9 at anterior end.	.76	.88	.72
Ratio of (3) to (4).	1.68	1.36	1.22

For further comparison with the data given in the *Biologia*, *l. c.*, for the examples from Gualan and Surubres, fifteen males of *gracile minarum* from Chapada, abdomen 21.5–24.5, hind wing 13.5–15 mm., give the following numbers of postnodals: on the front wings, 9 (26.7 per cent.), 10 (70 per cent.), 11 (3.3 per cent.); on the hind wing 7 (6.7 per cent.), 8 (73.3 per cent.), 9 (20 per cent.). On the hind wings of these fifteen males, M_2 arises at the fourth postnodal in every case, M_{1a} (= ultranodal of de Selys) at the sixth (6.7 per cent.), seventh (86.7 per cent.) or eighth (6.7 per cent.) postnodal.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 15 ♂ and parts of 25 ? others, 1 ♀ and parts of 3 ? others, some numbered 29, 35, 44, 49, 79, 120, 148, 379 by the collector. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, January 16, 17, and 27, 1903, 4 ♂, numbered 16 by the collector. United States National Museum. The single female from Sapucay is *gracile* type.

72. **Acanthagrion gracile ablutum,** subsp. nov.

(PLATE V, FIG. 80.)

♂. Head dark brown or black above, each large blue postocular spot dotted here and there with black; nasus, a mid-basal labral point, antennæ, and in some even the lower part of the frons and the rhinarium black, remainder of the face blue, underside and rear of head very pale blue, or cream-color.

Prothorax black, its sides inferiorly, a lateral spot and a pair of median dots on the middle lobe blue. Hind margin of hind lobe convex, not remarkably produced.

Remainder of thorax blue, the following black: a mid-dorsal band .88 mm. wide at mid-height, an elongated spot at the upper end of the humeral and of the second lateral suture, a line on the upper end and a round dot (often brown) at about mid-length of the obsolete first lateral suture; a large angular brown spot occupies the lower end of the mesepimeron and the mesinfraepisternum.

Abdomen black, the following blue: the sides and under surfaces of 1–10, except where encroached upon by the dorsal black at the hind ends of 3–7; a transverse anteapical band on 1 (and in some also on 2); a narrow transverse basal ring on 3–7, confluent, at least in younger specimens, with the blue of the sides; nearly all of 8 and 9, except for an inferior longitudinal black stripe on each side of each segment. Segment 10 and the appendages as in *gracile* type.

Legs black, inferior surfaces of femora and of tibiæ pale (bluish?).

Wings clear; stigma rhomboidal, blackish, its costal edge longest; fore wings with 12–14 postnodals, 12 most frequent; hind wings with 10–12 postnodals, 11 most frequent; M_2 arising nearest the fifth.

♀. Differs from the male as follows: upper surface of head olive, nasus bluish, with a short black line on each side, antennæ olive or blue, black of prothorax and mid-dorsal mesothoracic stripe replaced by pale brown, hind prothoracic lobe pale brown with a median longitudinal black line, line on the upper end of the obsolete first lateral thoracic suture and round dot on the same suture pale brown, abdominal segment 8 black, its hindmost dorsal third blue, 9 blue, with a broad lateral black spot on each side, occupying the anterior half of the segment, 10 blue, a black stripe on each side and a black line along its posterior dorsal margin, the margin narrowly cleft medially to about half the length of the segment. Appendages a little shorter than 10, conical, black; anal tubercle and genital valves blue, "palps" of the latter black.

Legs chiefly pale (blue?), a black stripe widening distally on the antero-superior face of each femur, and a narrower black line on the same face of each tibia, tarsal articulations black.

Front wings with 13–14 postnodals, hind with 11–12.

Dimensions: Abdomen ♂ 25–29, ♀ 24.5–?; hind wing, ♂ 17.5–19, ♀ 18.5–20; width of head, ♂ 3.4, ♀ 3.4; width of one postocular spot, ♂ .64, ♀ .68; maximum height of segment 10, ♂ 1.1; height of segment 9 at base, ♂ .84; width of tip of dorsal process of 10, ♂ .34; maximum width of 10, ♂ .8 mm. The last six of the dimensions are based on only one individual of each sex.

Habitat: — BOLIVIA, near Coroico, Yungas, May 2 and 10, June 7, 1899, 5 ♂, and Chulumani, November 29 and December 17, 1898, 2 ♀, all by W. J. Gerhard. Academy of Natural Sciences of Philadelphia.

The subspecific name proposed alludes to the absence in large part of the usual black humeral stripe of *A. gracile*, by which absence this subspecies may be readily recognized.

73. **Acanthagrion gracile ascendens** n. subsp.

(PLATE V, FIGS. 81, 81*a*.)

♂. Agreeing closely with typical *gracile* and in its chief features resembling specimens from Surubres mentioned under *gracile minarum*. It differs from all the forms of *gracile* known to me in its *narrow* dorsal process on abdominal segment 10 combined with the great height of that segment, the *process being only one-third as wide as the segment*, barely notched at tip, while in *gracile* type and varieties and in *gracile minarum* the process is half as wide as the segment. The following measurements in millimeters may be compared with those given under the preceding subspecies :

	gracile type Rio Janeiro.	*gracile ascendens* Cachoeira.
(1) Width of head.	3.24	2.92
(2) Width of one postocular spot, etc.	.52	.52
Ratio of (2) to (1).	.16	.178
(3) Maximum height of 10.	1.04	1.12
(4) Height of 9 at base.	.8	.6
Ratio of (3) to (4).	1.3	1.87
(5) Width of tip of process on 10, end view.	.4	.24
(6) width of 10, end view.	.72	.72
Ratio of (5) to (6).	.55	.33

The colors of *gracile ascendens* are as in *gracile* type, the hindmost sixth of abdominal segment 10 being blue. Front wings with 9 postnodals, hind wings with 8 ; M_2 and M_{1a} arising on the hind pair at the fourth and seventh postnodals respectively. Abdomen 27, hind wing 16 mm.

Habitat : — BRAZIL, Cachoeira, by H. H. Smith, 1 ♂ numbered 46. Carnegie Museum, Pittsburgh.

74. **Acanthagrion apicale** Selys.

(PLATE V, FIGS. 82, 82*a*.)

Habitat : — PERU, Iquitos, Staudinger, 1♂. Museum of Comparative Zoölogy, Cambridge, Mass.

75. **Acanthagrion cuyabæ** sp. nov.

(PLATE V, FIGS. 85, 86.)

♂. Upper surface of the head black, with the usual pale (green) postocular spots ; face up to the level of the second antennal joint and including the first joint (and in some also the anterior surface of the second joint) pale green ; a short line on each side of the nasus, in some a mid-nasal point and a line on the fronto-nasal suture, and a mid-basal labral point, black ; rear and under surfaces of the head pale.

Prothorax black ; a mid-dorsal spot on its front lobe, a lateral spot and often a pair of median dots or lines on the middle lobe, and the sides inferiorly pale green ; hind margin of hind lobe convex, not remarkably produced.

Dorsum of remainder of thorax black ; a pale green antehumeral stripe, which widens inferiorly, and at mid-height is one-third to one-half as wide as the black mid-dorsal band and one-half to three-fourths as wide as the black humeral stripe; sides of the thorax pale green, a short black line at the upper end of the second lateral suture.

Dorsum of abdominal segments 1–7 and 10 black, which black is narrowly constricted at the hind end of 1 and the base of 3, or in some interrupted near the hind end of 1, thus forming a transverse green ring, widened angularly before the hind end of 2 and subsequently contracted to its former width, widened also at the hind ends of 3–7. Sides of 1–7 pale green, or posteriorly pale blue, confluent with a narrow green ring at the articulation of 1 and 2 and at the base of 4–7; the dorsal black of 2 extends broadly forward to the green ring above mentioned and is not at all pointed anteriorly, as is the case on 3; 8 and 9 and the sides of 10 blue. Hind margin of 10 but very slightly elevated into a process, which has the general form of that of *A. gracile* and is truncated at the tip.

Superior appendages shorter than 10, of the general form of those of *A. gracile*, but shorter, directed ventrad as well as caudad; in profile view, contracted near the middle of their length, thicker at both base and apex, which latter is rounded; in dorsal view each appendage has an inner (mesal) process at the base, which, as in *gracile*, is in contact with the process of its fellow of the opposite side.

Inferior appendages shorter than the superiors and than those of *gracile;* each curved strongly upward in its distal *half* as well as towards the median line.

Legs pale green, femora with a superior black band, tibiæ with a superior and an inferior black line less marked on those of the third legs, tarsal articulations black.

Wings clear, stigma rhomboidal, blackish, its costal edge longest. Front wings with 8–9 postnodals, 9 most frequent; hind wings with 7–8 postnodals, 7 most frequent, M_2 arising nearest the fourth.

Dimensions: Abdomen 23–25; hind wing 14–16; width of head 3; width of one postocular spot .56; maximum height of segment 10 .76; height of segment 9 at base .68; width of tip of dorsal process of 10 .32; maximum width of 10 .74 mm.

♀. Unknown.

Habitat: — BRAZIL, Cuyabá, 4 ♂ and parts of three others; Uacaryzal, 1 ♂; Cachoeira Cuyabá, flooded campos, January 26, 2 ♂ and parts of 7 others, some numbered 12, 24 or 25 by the collector; all by H. H. Smith. Carnegie Museum, Pittsburgh.

76. **Acanthagrion cuyabæ fimense** subsp. nov.

(PLATE V, FIG. 84.)

♂. A single male from the State of Bahia is perhaps entitled to subspecific rank. It differs from *cuyabæ* type as follows:

Superior abdominal appendages thicker, heavier, especially as seen in profile view; pale colors blue throughout instead of green; mid-dorsal thoracic carina reddish; dorsal black on abdominal segment 2 narrowing anteriorly on the first third of the segment, but not pointed. Abdomen 24, hind wing 17 mm.

Habitat: — BRAZIL, Bom Fim, State of Bahia, Fazenda de Amaratu, November 20, 1907, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

77. **Acanthagrion cuyabæ freirense,** subsp. nov.

(PLATE V, FIG. 83.)

♂. Differs from *cuyabæ* type in having the superior appendages longer, distal portion not thicker than the middle, but tapering slightly to the rounded apex, dorsal black on abdominal segment 1 not constricted posteriorly, black of 2 forming a lance-head spot narrowing anteriorly, but not pointed, and reaching the anterior end of the segment by a band the width of which is .2 mm. 10 postnodals on the front wings; 8 or 9 on the hind. Abdomen 27, hind wing 17.5 mm.; maximum height of abd. seg. 10 1.0; height of seg. 9 at base .92 mm.

Habitat: — BRAZIL, Muniz Freire in the State of Espiritu Santo, June 18, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

This male approaches *A. gracile lancea* Selys, but differs, so far as I can judge from the descriptions of de Selys and Ris[19] and the latter's figure of the appendages, in having the inferior appendages more strongly curved upward, the superiors not reaching so high up on the hind surface of the tenth segment, more constricted in their distal half, (profile view), the tenth segment less elevated proportionally, and the black on the dorsum of the second abdominal segment more extended than de Selys describes for *gracile lancea*, viz.: "une tache dorsale noire en form de fer de lance appuyée sur le bord postérieur, où elle est un peu rétrécie et formant une pointe antérieure s'arrêtant à la moitié du segment, ou prolongée presque jusqu'à la base sur une ligne très-fine."

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[19] Hamburger Magalh. Sammelr., Odonaten, p. 11, 1904.

78. Acanthagrion truncatum.

(PLATE V, FIG. 87.)

Acanthagrion truncatum Selys, Bull. Acad. Belg. (2) xli, p. 311. 1876.

The following measurements, taken from a single male, are added for comparison with those given for allied species: width of head 2.72; width of one pale postocular spot .24; maximum height of abdominal segment 10 .72; height of abdominal segment 9 at base .72; width of tip of dorsal process of 10, end view, .24; maximum width of 10, end view, .56 mm.

Twenty-five males and three females give the following data on the origin of M_2 on the hind wings: nearest the third postnodal, 24 per cent. ♂, 33⅓ per cent. ♀; midway between 3d and 4th, 30 per cent. ♂, 33⅓ per cent. ♀; nearest 4th, 44 per cent. ♂, 16⅔ per cent. ♀ (1 hind wing ♀ broken).

Habitat: — BRAZIL, Chapada in May, by H. H. Smith, 12 ♂ and and parts of 18 others, 1 ♀ and parts of 2 others; collector's numbers 77, 77*a*, 78, 79, 119, 146. Carnegie Museum, Pittsburgh.

Sete Lagoas, Minas Geraes, May, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum.

Saõ Paulo, September 14, 1900, by A. Hempel, 3 ♂, No. 304. Academy of Natural Sciences of Philadelphia.

79. Acanthagrion temporale.

(PLATE V, FIG. 92.)

Acanthagrion temporale Selys, Bull. Acad. Belg. (2) xli, p. 312. 1876.

♂. De Selys' description was based on a pair, the male of which was imperfect. To fill up the gaps thus caused in his account, the following notes are added:

Abdominal segments 8 and 9 and the sides of 10 blue, dorsum of 10 black, its hind margin with the usual median semicircular excision, the edges of which are elevated into a process having a truncated tip when viewed from behind.

Superior appendages directed strongly downward (ventrad) as well as caudad, about equal in length to 10, when allowance is made for their declined position; in profile view slightly constricted at two-thirds' length, again enlarged at the apex which is rounded and slightly notched.

Inferior appendages projecting caudad to the same level as do the superiors, curved slightly upward and slightly inward at apex.

Front wings with 8–9 postnodals, hind with 7; 90 per cent. of the hind wings of 15 ♂ have M_2 arising nearest the fourth postnodal.

Dimensions: Abdomen 19.5–20; hind wing 12.5–13; width of head 2.76; width of one postocular spot .32; height of abdominal segment 10 .8; height of segment 9 at base .76; width of dorsal process of 10, end view, .22; maximum width of 10, end view, .64 mm. The last six measurements taken from one individual only.

♀. Nasus black, its free margin narrowly pale. In the Cachoeira example the black dorsal marks on 9 reach the whole length of the segment. Two females have M_2 on the hind wings arising nearest the fourth postnodal; in the third female it arises nearest the third. Abdomen 20–21.5, hind wing 14–15 mm.

Habitat: — BRAZIL, Cachoeira Cuyabá, flooded campo, January 26, 2 ♂, 1 ♀, No. 15, and Chapada, 6 ♂ and parts of 10 others, and of 1 ♀, nos. 77, 147, 147*a*, all by H. H. Smith. Carnegie Museum, Pittsburgh.

Barreiras, State of Bahia, January 3, 1908, 1 imperfect ♂; and Sete Lagoas, Minas Geraes, May 4, 1908, 1 ♀, both by J. D. Haseman. Carnegie Museum.

80. **Acanthagrion chararum,** sp. nov.

(PLATE V, FIGS. 88, 89.)

♂. Vertex dark blackish-brown, this color reaching down between the antennæ to the nasus, which may be of the same color narrowly bordered with blue on its free margin, or blue with a dark streak on each side. Blue postocular spots very large, separated only incompletely from the pale (cream?) color of the rear of the head by a narrow brownish stripe. Rhinarium, labrum, genæ, and external surfaces of mandibles pale blue; a black mid-basal labral point; labium pale (blue or cream-color?).

Prothorax blackish-brown, front lobe, a lateral spot and a pair of median lines on the middle lobe, middle of the hind lobe and the sides inferiorly blue; hind margin of hind lobe convex, low.

Dorsum of meso-metathorax dark reddish-brown; a blue antehumeral stripe widening somewhat inferiorly, at mid-height one-fourth to three-fifths as wide as the dark mid-dorsal, and one-half, or more, as wide as the dark humeral stripe; the dark mid-dorsal stripe is much contracted at its extreme anterior (lower) end; the dark humeral stripe is contracted both at the upper and near the lower end of the humeral suture and at the latter its outer edge bends outward (laterad) and backward (caudad) almost at right angles, then again downward (ventrad) and forward (cephalad) on the lower part of the mesepimeron, continuing downward over the mesinfraepisternum. These dark stripes (humeral and mid-dorsal) show a tendency to become black along the middle line of each stripe leaving the edges and extremities brown, and eventually probably become black throughout. Sides of the thorax blue; a short very fine brown or black line on the upper end of the obsolete first lateral suture, a longer thicker black line on the upper end of the second suture, in some continued downward by a very fine line; pectus blue.

Abdominal segments 1 and 2 blue; the intersegmental articulations of 1 and 2 and of 2 and 3, a square dorsal basal spot on 1, and an isolated triangular dorsal spot with its anterior angle more or less truncated on the middle of 2, black. Dorsum of 3–7 black, having a lanceolate form on 3 and 4, narrower and more acutely pointed anteriorly on 3, and markedly contracted at three-fourths or four-fifths of the length of the segment, again widening to the hind end; sides and a transverse basal ring on 3–7 blue, blue decreasing in extent on each successive segment. Segments 8–10 blue, hind margin of 10 very slightly excised and elevated into a low process, the tip of which in rear view is rather rounded than truncated.

Superior appendages a little longer than 10, in dorsal view nearly straight, somewhat divergent, each one rather narrow, its inner edge straight, outer edge slightly convex, apex tapering, subacute; the inner basal process of each appendage corresponding to that of *A. gracile* is present, but concealed under the hind margin of 10; in profile view each appendage rapidly decreases in thickness in its basal half, its upper edge slanting caudad and ventrad, its lower edge nearly horizontal, distal half slenderer, of subuniform thickness, directed slightly upward, apex subacute. Inferior appendages about two-fifths as long as the superiors, appearing merely as small tubercles applied against the lower surfaces of the superiors. Legs blue; a superior band on the femora, much of the tarsi, and, in some at least, the tibiæ blackish inferiorly.

Wings clear, stigma rhomboidal, blackish, its costal edge more often longer than the proximal or distal edges, but not infrequently equal in length. Front wings with 10–11 postnodals, 11 more frequent; hind wings with 8–10 postnodals, 9 most frequent; M_2 arising nearest the fourth.

Dimensions : Abdomen 26–28.5; hind wing 18–19.5; width of head 3.4; width of one postocular spot .72; maximum height of segment 10 .96; height of segment 9 at base .84; width of tip of dorsal process of 10 about .16; maximum width of 10 .8 mm. The last six dimensions taken from one specimen only.

♀ unknown.

Habitat : — BRAZIL, Cuyabá, 7 ♂ and parts of 1 other; Cachoeira, parts of 2? ♂ numbered 26 by the collector; all by H. H. Smith. Carnegie Museum, Pittsburgh.

The specific name is suggested by that of the nearby Charaes, Xaraes, or Jaraes marshes, taken in turn from that of a former Indian tribe.

81. **Acanthagrion chacoënse,** sp. nov.

(PLATE V, FIGS. 90, 91.)

♂. Vertex black, this color reaching down on the frons between the antennæ almost to the nasus, which is also black narrowly bordered with blue along its free margin, black of frons and of nasus connected by a vertical black line; the following blue: postocular spots, a dot on each side of the median ocellus, a larger spot behind each antenna-base, a short line between the median ocellus and each antenna, genæ, external surface of mandibles, labrum (except a mid-basal black point) and the labium, or the last possibly cream-color in life. Rear of the head partly pruinose, but apparently largely blue.

Prothorax black; sides inferiorly, a dorsal spot on the front lobe, a pair of short median lines on the middle lobe, a mid-dorsal trace on the hind lobe, blue; hind margin of hind lobe low, convex, slightly truncated, and with a minute notch medially.

Dorsum of meso-metathorax black; a blue antehumeral stripe, which is narrowest at two-thirds' height, and at mid-height is one-third as wide as the black mid-dorsal and one-half as wide as the black humeral; black mid-dorsal much contracted at its anterior (lower) end; black humeral stripe uniting at its upper end with a short black line on the upper end of the obsolete first lateral suture, at its lower end its outer edge bends twice similarly to the condition described for *A. chararum.* Sides blue, a black stripe on the second lateral suture from the upper end to more than half-way to the level of the metastigma below, which latter is a blackish spot. Pectus pale blue, a blackish area, covered with pruinose, at the hind end.

Dorsum of abdominal segment 1 black, (in the Corumba ♂ a narrow transverse apical blue ring), sides blue; dorsum of 2 black, sides, a narrow transverse basal ring (mid-dorsally interrupted by a fine black line) and a very fine transverse apical ring, blue; dorsum of 3–7 black, this color narrowed at four-fifths of each segment's length and widened greatly in the hindmost fifth; sides and a transverse basal ring on these segments blue; 8 and 9 blue; 10 black, except ventrally, otherwise as in *A. chararum.*

Superior appendages very similar to those of *A. chararum*, but in profile view a little thicker at the base, decreasing in thickness more rapidly in the proximal half. Inferiors as in *A. chararum.*

Legs pale blue; femora with a superior stripe, tibiæ with an anterior line, black.

Wings uncolored, stigma rhomboidal, blackish, its costal edge equal to, or slightly longer, or slightly shorter, than the proximal or distal edges. Front wings with 10–12 postnodals, hind wings with 8–9; M_2 on the latter arising nearest the fourth postnodal, or between the fourth and fifth.

Dimensions: Abdomen 25–26; hind wing 17; width of head 3.32; width of one postocular spot .52; maximum height of segment 10 .92; height of segment 9 at base .76; width of tip of process of 10, end view, about .16; maximum width of 10 .84 mm.

♀ unknown.

Habitat: — BOLIVIA, Piedra Blanca, April, 1 ♂.

BRAZIL, Corumba, May, part of 1 ♂. Both specimens by H. H. Smith, Carnegie Museum, Pittsburgh.

82. **Acanthagrion chirihuanum,** sp. nov.

(PLATE V, FIGS. 93, 94.)

♂. Upper surface of the head olive, passing gradually into greenish-blue on clypeus and labrum; each large blue postocular spot is bounded anteriorly and posteriorly by an ill-defined blackish line, these lines being the only black markings on the head. Rear of the head blue, labium cream-colored.

Prothorax blue, hind margin low, slightly trilobed, median lobe a little more convex than the lateral lobes.

Meso-metathorax blue; a mid-dorsal black band narrowing from .36 mm. at its upper (posterior) end to .24 mm. at its lower (anterior) end. In the imperfect male this band is similarly proportioned, but narrower. A short black mark near the upper end of the humeral suture continued downward by a very fine brown line ; a brown point near the lower end of the mesepimeron ; a small black spot at nearly mid-length of the obsolete first lateral suture ; a short black mark at the upper end of the second lateral suture.

Abdominal segments 1–3 chiefly blue, with the following black : a square dorsal basal spot on 1, the intersegmental articulations between 1 and 2 and 2 and 3, a short isolated transverse band on the dorsum of 2 at two-thirds' length, and the hindmost sixth of 3. Dorsum of 4–7 dark brown, becoming black at the hind end of each segment, a narrow transverse basal ring on each and the sides inferiorly blue; 8–10 blue, hind margin of 10 with a median dorsal, almost semicircular, excision, reaching more than half-way toward the anterior margin of the segment, edges of the excision only slightly elevated, presenting the appearance in end view of a low truncated process slightly bilobed.

Superior appendages in dorsal view wider than long, shorter than 10, bifid at apex, branches of equal length, outer branch with a more acute tip, inner branch applied against the inner branch of its fellow of the opposite side, the surface thus in contact black, while the rest of the appendage is pale blue ; in end view the inner branch is much higher than the outer, and is easily recognized by its black contact-surface just mentioned ; in profile view each superior appendage is directed slightly upward ; upper and lower edges straight and slightly divergent, the apparent apex being formed by the moderately convex black posterior margin of the inner branch, on which is silhouetted the acute pale blue tip of the outer branch. Inferior appendages projecting caudad about twice as far as do the superiors, thick at the base, tapering to the subacute tip, which is directed upward and but slightly toward its fellow of the opposite side.

Legs pale blue, femora with a superior blackish band.

Wings clear, stigma rhomboidal, blackish, its costal edge longest; front wings with 10–11 postnodals ; hind wings with 9 postnodals; M_2 arising nearest the fourth or (one wing) fifth.

Dimensions : Abdomen 25.5 ; hind wing 15.5–16 ; width of head 3.68 ; width of one blue postocular spot .64 ; maximum height of 10 .92 ; height of 9 at base .96 ; width of tip of dorsal process of 10 .36 ; maximum width of 10 .64 mm.

♀ unknown.

Habitat : — BRAZIL, Cuyabá, by H. H. Smith, 1 ♂ and part of one other. Carnegie Museum, Pittsburgh.

The specific name proposed is derived from that of an Indian tribe of the neighborhood.

83. **Acanthagrion interruptum** Selys.

Acanthagrion interruptum Ris, Hamburg. Magal. Sammelr. Odon., p. 10, fig. 4. 1904.

Habitat: — CHILE, Baños de Cauquenes, 1 ♀. U. S. National Museum.

Talca, 2 ♂ 1 ♀, Lota 1 ♂ 1 ♀, Penco, 48 ♂ 16 ♀, Concepcion, 8 ♂, 8 ♀, all in January, 1905. Academy of Natural Sciences, Philadelphia.

All the above specimens were collected by Señor Carlos E. Reed.

84. **Acanthagrion cheliferum.**

(PLATE V, FIG. 98.)

Acanthagrion ? cheliferum Selys, Bull. Acad. Belg. (2) xli, p. 319. 1876.

Acanthagrion cheliferum Ris, Hamburg. Magal. Sammelr., Odon., p. 12, fig. 7 (apps. ♂). 1904.

Six males and six females give the following data for the hind wings: costal edge of stigma longer (100 per cent. ♂, 83$\frac{1}{3}$ per cent. ♀) or shorter (16$\frac{2}{3}$ per cent. ♀) than proximal or distal edges; M_2 arising nearest the fourth (75 per cent. ♂, 100 per cent. ♀), third (16$\frac{2}{3}$ per cent. ♂), or midway between the third and fourth (8$\frac{1}{3}$ per cent. ♂) postnodal.

As noted by Dr. Ris for his material from Bahia, so in the present specimens from that locality, the nasus is pale blue, except for a black line on the fronto-nasal suture. There is no perpendicular median black line on the frons connecting the black of the upper part of the frons with that of the nasus; the blue postocular spots are larger as well as the blue lateral spots on the middle lobe of the prothorax; this lobe has also a pair of median blue lines, the antehumeral blue stripe is wider and abdominal segment 8 is entirely blue. Hagen had attached the manuscript name of *rusticum* to these Bahia examples, and this name may be employed subspecifically, if desired. The abdomen ♂ is 25 mm., hind wing ♂ 15.5–17 mm.

The remainder of the material has the usual characters of *cheliferum* type, with abdominal segment 8 black or dark bronze-green dorsally in both sexes, except in one male from Rio Grande do Sul, in which the hindmost third of the dorsum of 8 is blue, confluent with that of the sides. The females of form *a* of Ris have a pair of basal dorsal black spots on 9. Abdomen ♂ 20.5–23, ♀ 20.5–22; hind wing ♂ 13–14.5, ♀ 14–15.5 mm.

Habitat: — BRAZIL, Saõ Paulo, September 14, 1900, by A. Hempel, 3 pairs (the ♀♀ form *b* of Ris), no. 303; and Rio Grande do Sul, by H. v. Ihering, 2 ♂, 2 ♀ (form *a* of Ris), no. 330. Academy of Natural Sciences of Philadelphia.

ARGENTINA, Santa Helena, December 21, by H. H. Smith, 1 ♀ (form *a* of Ris). Carnegie Museum, Pittsburgh.

Subspecies? *rusticum:* BRAZIL, Bahia, 1 ♂ and parts of 1 other? and of 1 ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

Judging from the scanty material before me the females of *cheliferum* (and *rusticum*) differ from those of *ambiguum* by the wider head, 3.1–3.2 mm., as compared with 2.8 mm., and the lower, less deeply bilobed, hind prothoracic margin.

85. **Acanthagrion ambiguum.**

(PLATE V, FIG. 97.)

Acanthagrion ambiguum, Ris, Hamburg. Magal. Sammelr., Odon., p. 13, fig. 8 (apps. ♂). 1904.

In the present material: the costal edge of the pterostigma varies from longer than, equal to, to shorter than the proximal or distal edges; M_2 on the hind wings arises nearest the fourth postnodal in one male and the female, nearest the third on the right side and midway between third and fourth on the left side of the other male. The female seems to be form *b* of Ris, or perhaps is intermediate between *b* and *c*; its colors are somewhat faded, its prothorax is reddish, with a transverse black line between the middle and hind lobes; hind margin a little higher than in the ♂, rather deeply bilobed.

Abdomen ♂ 19, ♀ 20; hind wing ♂ 12, ♀ 14 mm.

Front wings with 8–9 postnodals, hind wings 6–7.

Habitat: — PARAGUAY, Villeta, by H. H. Smith, 2 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

86. **Skiallagma simulacrum,** sp. nov.

(PLATE V, FIGS. 95, 96.)

♂. Vertex obscure olive, areas corresponding to the pale postocular spots of allied genera blackish, or dark metallic-green; a reddish line between each lateral ocellus and the base of the antenna of the same side; face up to, and including, the second antennal joint pale greenish-blue; rear of the head pale blue; labium cream-colored.

Prothorax blue, middle of hind lobe and in some also of middle lobe blackish, hind margin flatly convex.

Meso-metathorax blue, a mid-dorsal band, .32–.52 mm. wide at mid-height, very slightly narrower below (anteriorly), dark metallic-green, margined with a black line on each side, or entirely black; a black line on the entire length of the humeral suture, a little widened at its upper end; a very fine short black line on the upper end, and a black spot near mid-length of the obsolete first lateral suture; a black mark at the upper end of the second lateral suture; the blue antehumeral stripe varies in width from wider to somewhat narrower than the dark mid-dorsal.

Abdominal segments 1–3 blue, the following markings black: a square basal dorsal spot on 1, occasionally connected with the hind margin of the segment by a fine black line, the articulations of 1 and 2 and of 2 and 3 very narrowly, a rounded spot on the posterior half of 2 connected with the hind end of the segment and in some with the anterior margin by a mid-dorsal black line, and the hindmost fourth of 3; in two specimens the black spot on 2 is reduced to an isolated transverse stripe. Dorsum of 4–7 dark brown, becoming blackish on the hind end of each segment, where it reaches down on the sides, which latter, together with a transverse basal ring on each segment, are blue. 8 and 9 and the sides of 10 blue. Dorsum of 10 black, its hind margin with a median concave excision, extending from one-third to one-half way toward the anterior margin of the segment, edges of excision somewhat elevated to form a dorsal process, the tip of which is truncated and somewhat bilobed in rear view, much as in some species of *Acanthagrion*.

Superior appendages in dorsal view about one-third as long as 10, much wider than long, apex as wide as, or wider than, the base, shallowly concave, inner apical angle, thus formed, slightly more acute than the outer, each appendage in contact with its fellow of the opposite side; in profile view the lower outer portion of the appendage is prolonged somewhat downward, and the more acute inner apical angle shows as a minute more dorsally placed spine.

Inferior appendages projecting caudad beyond the level of the superiors for a distance equal to about one-half of the length of the latter, tapering from the base to the apex, which is curved upward; the apex is narrower in profile than in ventral view, as in the latter the two inferiors converge and the apex of each is transversely truncated.

Legs pale blue; femora with a superior blackish stripe.

Wings clear, stigma grayish-brown, its costal edge longest, vein A (= inferior sector of the triangle of de Selys) separating from the hind margin at (85 per cent. front wings, 70 per cent. hind) or distal to (30 per cent. hind wings) the cubito-anal cross-vein (= basal postcostal vein of de Selys); front wings with 9–10 postnodals, 9 more frequent; hind wings with 7–9 postnodals, 8 most frequent; M_2 (= nodal sector of de Selys) arising nearest the fourth (95 per cent.). The percentages are based on 10 males.

Abdomen 23.5–24.5; hind wing 14–16 mm.

One male has a blackish spot on the middle of the nasus; an ill-defined blackish spot on the lower part of the mesepimeron, confluent with the lower end of the black humeral line, and the black on abdominal segment 3 prolonged forward to within one-fifth of the length of the segment from the base as a narrow stripe very acutely pointed anteriorly. The ventral side of the thorax is pruinose, so that these additional black markings are perhaps accompaniments of age.

One other male shows traces of pale postocular spots; possibly in this species there is an ontogenetic disappearance of these spots as in *Hesperagrion heterodoxum* (Selys) of Mexico.[20]

♀. Unknown.

Habitat: — BRAZIL, Cuyabá, 4 ♂ and parts of 8 others; Cuyabá, lakes, January, 1886, part of 1 ♂; Cachoeira Cuyabá, flooded campo, January 26, part of 1 ♂, no. 13; all by H. H. Smith. Carnegie Museum, Pittsburgh.

Skiallagma simulacrum shows an extraordinary resemblance in form and color to *Acanthagrion chirihuanum*, a resemblance which has suggested the specific name here proposed. It differs from that species at once in the shape of the abdominal appendages and in the absence of pale postocular spots.

From the description of the only other known species of *Skiallagma*, *S. baueri* Förster,[21] *S. simulacrum* differs in the greater extent of blue on the face, prothorax, meso-thoracic dorsum, and abdominal segment 3; the shorter superior and the longer (relatively to the superiors, at least) inferior abdominal appendages.

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[20] *Cf.* Biologia Centrali-Americana, Neuropt., p. 103.

[21] Insekten Börse, xxiii, p. 15, 1906. In that description, second column, 4th line, for "Thorax" read "Abdomen."

Genus OXYAGRION.

The genera *Oxyagrion* and *Telebasis* (*Erythragrion* Selys) are much alike, differing chiefly in the presence of a vulvar spine in the females of the former and its absence in the latter. De Selys has also suggested[22] that in the males of *Oxyagrion* one or more of the posterior abdominal segments are blue, while this is not the case in *Telebasis*. Of the ten species which he referred to *Oxyagrion* in 1876,[23] three, however (*pavidum*, *miniopsis* and *basale*), have no blue abdominal segment, so that this distinction is not very helpful.

A better character is perhaps furnished by the color-pattern of the thoracic dorsum, which in *Oxyagrion* never presents any darker marking than brown, while in *Telebasis* there is always present a dark metallic-green or black stripe or band on each mesepisternum.

87. **Oxyagrion pavidum** Selys.

Habitat: BRAZIL, Desterro, December, one pair ♂♀, by H. H. Smith. Carnegie Museum, Pittsburgh.

88. **Oxyagrion terminale** Selys.

Oxyagrion terminale Ris, Hamburg. Magal. Sammelr. Odon. p. 9, fig. 2. 1904.

Habitat: — BRAZIL, Rio Grande de Sul, by H. H. Smith, 1 ♂. Carnegie Museum.

PARAGUAY, Sapucay, December, 1899, by W. T. Foster, 1 ♂. U. S. N. M.

89. **Oxyagrion evanescens,** sp. nov.

(PLATE III, FIG. 51; PLATE VIII, FIG. 142.)

♂. Vertex and labrum obscure, blackish or reddish-brown; traces of a reddish spot on each side a little anterior to the area occupied by the pale postocular spot of allied genera; frons, clypeus, and antennæ red; free margin of labrum, genæ, labium, and rear of head yellow.

Prothorax and thoracic dorsum reddish-brown; hind prothoracic margin low, convex; sides and ventral surface of meso-metathoracic pale greenish-yellow; a short black mark at the upper ends of humeral and second lateral sutures.

Abdominal segments 1–8 red, 1 and 2 yellow inferiorly; a pair of anteapical dorsal blackish spots on 8; 9 pale (blue?), with a blackish or brownish spot or stripe on each side; 10 obscure, with a blue? dorsal spot and a brown lateral mark.

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[22] Bull. Acad. Belg. (2) xlii, p. 956.

[23] *l. c.*, xli, p. 291 et seq.

Hind margin of 10 excised mid-dorsally one-fourth way toward base, margins of excision elevated, forming a process the tip of which in rear view is truncated.

Superior appendages in dorsal view about two-thirds as long as 10, black, inner surface pale, narrowing from base to apex, which lies at the outer edge of the appendage, so that while the outer edges of the two appendages are subparallel, their inner edges are decidedly diverging from the supero-internal basal process of each, which approaches, but is not applied against, its fellow of the opposite side; in profile view each superior appendage is directed downward as well as caudad, and is of uniform thickness in its proximal two-thirds or half, narrowed on its upper edge in the remaining distal portion, apex rounded.

Inferior appendages in profile view reaching to the level of two-thirds or more of the superiors; basal half thick, rounded, upper margin prolonged as a slender process to form the distal half of the appendage, curved upward and inward, apex acute.

Legs pale yellow; third tibia with 7–8 spines in the anterior (outer) row.

Wings clear, veins pale brown; stigma red, very small, oblique, surmounting from one-third of a cell to slightly less than one cell, variable in its proportions, costal edge on the front wings more often longer than the proximal or distal edges, but on the hind wings longer than, equal to, or shorter than those edges. Vein A (= inferior sector of the triangle of de Selys) separating from the hind margin at, or distal to, the cubito-anal cross-vein (= basal postcostal of de Selys). M_2 (= nodal sector of de Selys) arising on the hind wings nearest the fourth or third postnodal. Postnodals on the front wings 7–8 (7), on the hind 6–7 (6), the parentheses enclosing the numbers of greatest frequency.

Dimensions: Abdomen 20–21; hind wing 13–14.5 mm.

♀ unknown.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♂ and parts of 5 others. Carnegie Museum, Pittsburgh.

The specific name proposed has been suggested by the small size of the pterostigma.

90. **Oxyagrion divaricatum** sp. nov.

(PLATE III, FIGS. 47, 48.)

♂. Dorsal surface of head, of nasus, and of thorax pale reddish-brown, redder on thorax than on the head; lower margin of frons, genæ, labium, and under and rear surfaces of head, legs, much of the ventral surface of the thorax and sides of the abdomen inferiorly yellow; labrum (its free margin yellow) and dorsum of abdominal segments 1–6 bright red. Labrum yellow, thoracic dorsum paler, ochreous, in young individuals.

Hind margin of prothorax slightly produced into a median angle. Mesepimera and metepimera each with a rather wide dull-yellowish band, the area posterior to each band reddish-brown of the same shade as the thoracic dorsum; possibly these bands may be due to post-mortem discoloration; they are not evident in the young.

The following abdominal markings are black: a fine transverse ring on the intersegmental articulations beginning with that between 2 and 3; a dorsal spot on the hind third to sixth of 6, but in some still smaller, and then isolated from the hind end of the segment; dorsum of 7 (except at the anterior end in some), 8, and 10. 9 is blue.

Hind margin of 10 medially elevated into a process with a rather narrow and slightly bifid tip. Superior appendages, viewed from above, a little longer than 10, reddish at base, blackish at apex, diverging throughout their length, each one with its outer edge slightly convex, inner edge slightly concave, narrowing to the subacute apex; in profile view each appendage is directed upward with the terminal third of the upper edge truncated almost horizontally, thus producing a fairly acute tip at the distal end of the lower edge. The inner and ventral surfaces of each superior appendage are grooved longitudinally.

Inferior appendages in profile view higher than long, upper apical angle slightly produced upward and caudad as a slender process, which reaches to about one-fourth of the length of the superiors, inferior apical angle rounded.

Wings clear, venation brown, darkening with age; stigma red, its costal edge longest.

♀. Differs from the ♂ as follows: less red in the brown of head and of thorax; labrum and sides of thorax yellowish-brown; the following black: a small mid-dorsal spot on 1, a transverse mark at two-thirds' length of 2 and at four-fifths' length of 3, the last fifth of 4 with a mid-dorsal line or stripe running forward for more than half the length of the segment, or merely an isolated, anteapical spot in the last fifth, posterior five-sixths of the dorsum of 5, and nearly all of the dorsum of 6–10, narrowing posteriorly on 9 and 10. Sides of 6–10 brownish yellow. Appendages ochreous, slightly shorter than 10, conical. A ventral posterior spine on 8. Genital valves not reaching to the level of the hind end of the anal tubercle (11th segment), ochreous, their palps blackish-brown. Pterostigma brownish-yellow. Hind margin of prothorax directed vertically upward, instead of sloping upward and caudad, as in the case of the ♂.

In the young ♀ the head and thorax are brownish-yellow; the pale color of abdominal segments 1–5 is yellowish instead of red; dark markings on 1–10 dark metallic-green, instead of black.

♂♀. Anal vein (= inferior sector of the triangle of de Selys) separating from the hind margin at, or distal to, the cubito-anal cross-vein (= basal postcostal of de Selys) on both front and hind wings. Front wings with 8–9 (♂) or 9–10 (♀) postnodals, 9 more frequent. Hind wings with 6–7 (♂) or 7–8 (♀) postnodals, 7 more frequent. M_2 (= nodal sector of de Selys) arising nearest the fourth postnodal.

Dimensions: Abdomen ♂ 24–25, ♀ 25; hind wing ♂ 15.5–16.5, ♀ 17–18.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 6 ♂ and parts of 4 others, 1 ♀ and parts of 4 others, nos. 81 and 143. Carnegie Museum, Pittsburgh.

Saõ Paulo, September 5 and 7, 1900 by A. Hempel, 1 ♂, 1 ♀. Academy of Natural Sciences of Philadelphia.

91. **Oxyagrion hempeli** sp. nov.

(PLATE III, FIGS. 52, 53.)

♂. Dorsal surface of head and of nasus black, an ill-defined reddish spot on each side a little anterior to that occupied by the pale postocular spots of allied genera. Genæ, labrum, (and lower part of frons?), pale blue. Labium and rear of head pale yellowish.

Thorax reddish; hind prothoracic margin low, convex; a narrow mid-dorsal mesothoracic stripe about three times as wide as the carina on which it lies; mes- and metepimera each with a rather broad pale greenish-brown or pale olive band, possibly due to postmortem discoloration.

Abdominal segments 1–6 bright coral-red dorsally, the following black: a fine transverse ring at the intersegmental articulations beginning with that between 2 and 3, a rounded dorsal spot on the last fifth of 5 and of 6, the dorsum of 7 and of 10, a superior dot (at three-fifths' length of 8 and midway on 9) and an inferior longitudinal stripe on each side of 8 and 9, which are otherwise blue. Ventral surface of the abdomen chiefly yellow.

Hind dorsal margin of 10 medially elevated and excised, the process so formed having a tip, which in rear view appears to be about one-fourth as wide as the segment and slightly bilobed.

Superior appendages in dorsal view subequal in length to 10, subparallel, widest at mid-length, apex subobtuse; in profile view they are directed caudad only slightly downward, tapering from base to the subacute apex.

Inferior appendages in profile view with the upper apical angle prolonged as a process reaching to three-fifths of the length of the superiors and directed caudad, not curved upward; in ventral view the processes of the two inferiors converge somewhat, the tip of each terminating on the inner side in a minute black hook.

Legs pale yellow

Wings clear, great veins of the anterior portions pale brown; stigma red, very oblique, costal edge equal to or shorter than the proximal edge; vein A (= inferior sector of the triangle of de Selys) separating from the hind margin at the cubito-anal cross-vein (= basal postcostal of de Selys). Front wings with 11–12 postnodals. Hind wings with 9 postnodals; M_2 (= nodal sector of de Selys) arising at the fourth.

Abdomen 28, hind wing 19 mm.

♀ unknown.

Habitat: — BRAZIL, Saõ Paulo, September 14, 1900, by A. Hempel, 1 ♂. Academy of Natural Sciences of Philadelphia.

92. **Oxyagrion rufulum** Hagen.

(PLATE III, FIGS. 49, 50.)

Agrion rufulum Hagen, Syn. Neur. N. Amer., p. 86. 1861.
Oxyagrion rufulum Selys, Bull. Acad. Belg. (2), xli, p. 302. 1876.

Both descriptions of this species are based on imperfect specimens, wherefore the following:

♂. To an example from Quillota, bearing the label "Agrion vicinum ♂ Hagen," I attached the following label in 1899, "Agrees with Hagen's type of *Ag. rufulum* which has lost last three abd. segs." I have not since seen the type; the Quillota male differs from the more detailed of the above descriptions (de Selys') as follows: Pterostigma surmounting the whole of one cell, 11 postnodals on the front wings, 9 on the hind; thoracic dorsum uniformly dark red with no indications of bands; sides reddish-yellow without bands. Abdominal segment 7 red as in 6, 8–10 yellowish-red, only the middle of the hind dorsal margin of 10 blackish adjacent to a median excision, the curved margin of which is elevated into a dorsal process, which viewed from behind shows a truncated tip nearly half as wide as the maximum width of 10. 10 is a little more than half as long as 9 in dorsal view, the superior appendages about one-and-one-third times as long as 10, but shorter than 9. The outer margin of each appendage is convex and curved inward (mesad) at the apex; inner margin slightly widened to one-fourth of the length, thence narrowed to two-thirds' length, where a strong triangular tooth projects inward almost at right angles, and is hardly distinct on its distal side from the rounded apex of the appendage. Viewed from behind, each superior appendage shows a supero-internal basal process, ending in a black tip applied against the corresponding process of the other side almost within the tenth segment itself. In profile view each superior appendage is directed caudad and slightly downward in its basal half, slightly upward in its extremity, thicker at the immediate base, then rather abruptly slenderer, gradually thickening to three-fourths' length, from which point the lower margin is truncated caudad and upward to the subacute apex.

Inferior appendages in profile view reaching to a little more than the level of half of the superiors, tapering rapidly in the basal half; distal half forming a rather slender process, which is curved moderately upward and ends in an acute tip.

Costal edge of the pterostigma the longest on all the wings. Vein A (= inferior sector of the triangle of de Selys) separating from the hind margin of the wings at (front), or a little distal to (hind) the cubito-anal cross-vein (= basal subcostal of de Selys). M_2 (= nodal sector of de Selys) arising on the hind wings at the fourth (left), or between the fourth and the fifth (right), postnodal.

8–9 spines in the anterior (outer) row of the third tibia.

Abdomen 26.5, hind wing 18 mm.

An immature male from Penco is perhaps of the same species, but the appendages are distorted, so that some doubt remains. It has the pterostigma yellow, grayish in the center, surmounting less than one cell on all wings; superior (anterior) side of the quadrilateral of the front wings longer, two-fifths as long as the posterior side, 13 postnodals on the front wings, 10 (right)–12 (left) on the hind, colors similar to those of the Quillota ♂ but paler; no markings or bands on the thorax; M_2 arising between the fourth and fifth postnodals on the hind wings; abdomen 26.5; hind wing 19 mm.

♀. A female from Penco agrees with the first Chilian female described by de Selys, assuming that the abdomen of the latter was reddish-yellow. Abdominal segment 7 has a mid-dorsal bronze band of equal width to that on 6, but not widened at the hind end of the segment which is attained; 8 has a similar band for the anterior two-thirds of its length; 9, 10, and the appendages yellow, unspotted, the last one-and-one-half times as long as 10. A strong ventral apical spine on 8. Genital valves yellow, not reaching to the level of the hind end of 10, their "palps" also yellow, barely attaining the level of the hind end of 11 (anal tubercle). Front wings with 11 (right) –13 (left) postnodals; hind with 11, at the fifth of which M_2 arises. Abdomen 26, hind wing 19 mm.

A female from Cordova, probably younger, is intermediate in abdominal markings between de Selys' two Chilian females, having 1 and 2 unmarked, 3–6 with a very narrow mid-dorsal bronze stripe widened posteriorly on each into the "petite tête ronde," 7 and 8 have the mid-dorsal bronze stripe wider, apparently reaching the entire length of 8, dorsum of 9 obscure at its hind end; 11 postnodals on the front wings, 9 on the hind; other details as above given for the Penco female. Abdomen 26, hind wing 19.5 mm.

Habitat: CHILE, Quillota, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

Penco, January, 1905, by Carlos E. Reed, 1 ♂, 1 ♀. Academy of Natural Sciences of Philadelphia.

ARGENTINA, Cordova, 1 ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

Judging from de Selys' description of *O. rubidum* (Rambur), that species, known by the male only, is very close to *O. rufulum*, differing only in the slightly longer abdomen and in the coloring of its last four segments. It is also possible that one or more of the females here or elsewhere referred to *O. rufulum* may properly belong to *O. rubidum*.

93. **Oxyagrion basale** Selys.

(PLATE III, FIGS. 54, 55.)

Oxyagrion basale Selys, Bull. Acad. Belg. (2) xli, p. 303. 1876.

♂. The considerable number of individuals, which I refer to this species, differ in the following respects from de Selys' description based on a single male from "Brésil":

Quadrilateral on the front wings with the superior (anterior) side a little longer, in others a little shorter, than the internal (proximal) side and about two-fifths to one-third as long as the inferior (posterior) side; on the hind wings the superior side is longer than the internal and half as long as the inferior. Black mid-dorsal thoracic band margined on each side in some by a yellow line. Often a superior black dot on each side of abdominal segment 8 at two-thirds' length, black on dorsum of 9 and 10 reaching to the hind end of each segment, or of 9 only, longitudinally divided by red in the anterior half only of 9. Apices of the inferior appendages acute, curved upward and inward. More or less well-defined pale green postocular spots dotted with black similar to the black dotting of the thoracic dorsum.

The younger males differ from the older ones (to which latter de Selys' description applies) as follows: labium and rear of the head pale yellowish, upper surface of the head reddish brown, as also are the areas dotted with black, on which the greenish postocular spots of older stages are present; prothorax brown, with black lines occupying the various grooves and sutures; thoracic dorsum yellowish-brown; no mid-dorsal black band, inferior humeral spot, or lateral band, but numerous blackish dots on the mesepisterna, less numerous on mesepimera and metepisterna, absent from the metepimera; a short black mark on the upper ends of the humeral and second lateral sutures; red of the abdomen less brilliant; dorsum of 1 and 2 reddish-brown, of 7–10 yellowish-brown; a superior darker brown spot on each side of 9 and of 10, a transverse dorsal blackish streak on 10; pterostigma paler brown; legs yellowish, with a superior femoral and an anterior tibial blackish stripe, or line, more or less interrupted.

Subsequently the upper surface of the head and of abdominal segments 1 and 2 darkens and the greenish postocular spots appear before the black mid-dorsal thoracic stripe.

♀ (not hitherto described). Labium, under and rear surfaces of head, and genæ pale yellow; vertex and frons olive, the latter paler inferiorly; ill-defined greenish postocular spots, yellow of rear of head immediately adjoining dotted with black, nasus and labrum obscure olive.

Prothorax greenish-brown, the grooves and sutures occupied by dark lines, a curved brown mark on each side of the middle lobe; meso-metathorax greenish, its markings as above described for the younger males.

Abdominal segment 1 yellowish, with a dorsal black spot; 2–10 at first yellow, later red, with the following black markings: a transverse line on the intersegmental articulations beginning with that between 2 and 3; an isolated transverse mark on the dorsum of 2 at two-thirds' length; a spot at the fifth sixth of 3 and 4, not reaching back to the hind end of the segment, but in some prolonged more or less forward as a fine mid-dorsal line; a rounded spot on the hind fifth of 5 and 6, in some prolonged forward, in others as a narrow mid-dorsal stripe almost to the base of each; nearly all of the dorsum of 7–10.

Hind margin of 10 narrowly cleft mid-dorsally about one-third way toward the anterior end. Appendages shorter than 10, conical, black. A ventral apical spine on abdominal segment 8. Genital valves yellow, reaching caudad almost to the level of the hind end of 11 (anal tubercle), their "palps" dark, reaching beyond the level of the tips of the abdominal appendages.

Legs as above described for the younger males. Pterostigma ochre-brown, oblique.

With age the browns of the body generally become darker and duller, vertex obscure blackish, but no black mid-dorsal thoracic band forms as in the male.

♂♀. Pterostigma in the majority of both sexes with the costal edge longest, but with a tendency (more marked in the hind wings and in the examples from Sapucay) to have the costal edge occasionally equal to, or even shorter than, the proximal or distal edges. Vein A (= inferior sector of the triangle of de Selys) separating from the hind margin of the wings at, or slightly distal to, the cubito-anal cross-vein (= basal postcostal of de Selys). M_2 (= nodal sector of de Selys) arising nearest the fourth postnodal (occasionally the fifth) on the hind wings. Postnodals, 10 ♂, 5 ♀, Chapada, front wings, ♂ 10–11 (11), ♀ 9–11 (11); hind wings, ♂♀ 8–10 (9). Postnodals, 7 ♂, 2 ♀, Sapucay, front wings, ♂ 11–12 (12), ♀ 11–13 (13); hind wings ♂ 9–10 (10), ♀ 10–11 (10). Parentheses enclose the numbers of greatest frequency.

Dimensions in millimeters: Abdomen ♂ 26.5–28 (Chapada), 26.5–29.5 (Sapucay); ♀ 27 (Chapada), 26–27 (Sapucay). Hind wing ♂ 17–19 (Chapada), 18–19.5 (Sapucay); ♀ 18–19.5 (Chapada), 19 (Sapucay). Width of tip of bifid dorsal process of abdominal segment 10 of ♂, rear view, .66; maximum width of segment 10 of ♂, rear view, .84.

Habitat: — BRAZIL, Sete Lagoas, Minas Geraes, May 3 and 4, 1908, by J. D. Haseman, 2 ♂. Carnegie Museum, Pittsburgh.

Chapada, by H. H. Smith, 8 ♂ and parts of 20 others, 1 ♀ and parts of 4 others; collector's numbers 11, 16, 115, 189, 197. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, November, 1899, to February, 1900, 6 ♂, 2 ♀, January 17, 1903, 1 ♂ numbered 59 (other males numbered 59 are *Oxyagrion impunctatum* n. sp.). U. S. National Museum.

94. **Oxyagrion impunctatum,** sp. nov.

(PLATE III, FIGS. 56, 57.)

♂. Vertex obscure, brownish, with traces of a pale spot on each side somewhat anterior to the area occupied by the postocular spot in allied genera; face carmine red; labium and rear of head yellow.

Prothorax brownish-yellow, its grooves and sutures occupied by black lines, its hind margin low, convex. Dorsum of meso-metathorax reddish brown or olive; sides and pectus paler, greenish-yellow; a short black mark at the upper ends of the humeral and lateral sutures.

Abdominal segments 1 and 2 yellowish, brown or red above; a pair of small mid-dorsal blackish spots on 1, a transverse dorsal blackish mark at three-fourths' length of 2; 3–10 red, more obscure on 7–10; a transverse black line on the intersegmental articulations of 3–6 in some.

Segment 10 and the appendages very similar to those of *O. basale*, *i. e.*, hind dorsal margin of 10 broadly excised in a concave curve, margins of the excision elevated and produced at the hind end on each side into an acute process, which is directed more nearly upward (dorsad) and not so much caudad and dorsad as is the case in *O. basale;* in rear view also this dorsal process is very similar to that of *O. basale*, but its lateral margins are nearly parallel, instead of diverging as in *O. basale.*

Superior appendages directed downward (ventrad) as well as caudad, slightly longer and slenderer than those of *O. basale;* apex rounded in profile view; an upper-inner basal proces sterminating in a black tip, which is applied against the tip of the process of the appendage of the opposite side of the body.

Inferior appendages, in profile view, reaching caudad to very little more than half the level the superiors, tapering rapidly in the basal half of each, distal half very slender, curved upward and inward, a little more strongly than in *O. basale.*

Legs yellowish, with an anterior dark stripe on femora and tibiæ, narrower and interrupted on the latter; third tibia with 7–8 black spines in the outer (anterior) row.

Wings clear, veins brown; stigma red, oblique, varying in its proportions in that the costal edge is longer than, equal to, or shorter than the proximal or distal edges in different individuals. Vein A (= inferior sector of the triangle of de Selys) separating from the hind margin of the wings distal to, or less frequently at, the cubito-anal cross-vein (= basal postcostal of de Selys). M_2 (= nodal sector of de Selys) arising on the hind wings nearest the fifth postnodal, or more distad. Postnodals, 9 ♂, Chapada: front wings 10–12 (12), hind wings 9–11 (10); 5 ♂, Sapucay: front wings 12–15 (12), hind wings, 10–13 (11). Parentheses enclose the numbers of greatest frequency.

Dimensions in millimeters: abdomen 27.5–28.5 (Chapada), 28–30 (Sapucay); hind wing 17.5–19.5 (Chapada), 19.5–21 (Sapucay); width of tip of dorsal process of abdominal segment 10, end view, .48; maximum width of 10, end view, .76.

♀ unknown.

Habitat:—BRAZIL, Chapada, by H. H. Smith, 2 ♂ and parts of 7 others, some dated May, some numbered 93 and 185. Carnegie Museum, Pittsburgh.

Saõ Paulo, by A. Hempel, September 7, 1900, 1 ♂. Academy of Natural Sciences of Philadelphia.

PARAGUAY, Sapucay, by W. T. Foster, January 16, 1903, 5 ♂, no. 59 (one other ♂ numbered 59 is *O. basale*). United States National Museum.

This species very much resembles *O. basale,* with which it was united by Mr. Foster under the same collection number. As the dates of collection at Sapucay are not identical, but differ by one day, it is probable that the two species do not occur in the same topographical locality. The absence of black dots on the thoracic dorsum, which has suggested the specific name *impunctatum*, renders this species easy to distinguish from *O. basale*.

It is worthy of note that in *O. impunctatum* as in *O. basale*, specimens from Sapucay tend to larger size and greater number of postnodals than in those from Chapada.

Genus TELEBASIS.

Group of *T. corallina*.

(The present material contains a number of forms closely related to *T. corallina* (Selys). It seems convenient to first give the common characters of these species, and then to limit the description of each form to those features in which it differs from its allies.)

Rear of the head pale, abdomen red, each mesepisternum with a dark metallic-green stripe *contiguous* to mid-dorsal carina.

1. Superior appendages of the male longer than the tenth abdominal segment, inferior appendages distinctly shorter than the superiors, dorsum of abdominal segments 1 and 2 at least not distinctly blackish; upper surface of the head dark metallic-green, with an oblique red line or streak between each lateral ocellus and the antenna of the same side, and a transverse reddish line or stripe bordering the postero-superior dorsal margin of the occiput.
corallina (Selys), *carmesina* n. sp., *sanguinalis* n. sp.
2. Superior appendages of the male as long as the tenth abdominal segment, inferior appendages subequal in length to the superiors, dorsum of abdominal segment 1 and of the anterior half of 2 blackish or blackish-brown; upper surface of the head dark metallic-green, its markings as indicated below.
coccinata n. sp., *carminita* n. sp., *coccinea* (Selys)

95. **Telebasis corallina** Selys.

(PLATE V, FIG. 99.)

Erythragrion corallinum Selys, Bull. Acad. Belg. (2) xlii, p. 964. 1876.
Telebasis corallina Kirby, Cat. Odon., p. 155. 1890.

♂. Transverse reddish occipital stripe terminating on each side in a larger reddish spot.

Labrum bluish-green ("lèvres jaunâtres" Selys).

Prothorax entirely reddish.

Mid-dorsal thoracic carina reddish, the dark metallic-green stripe on each side of the carina one-third as wide as the mesepisternum on which it lies, remainder of mesepisterna and mesepimera reddish, metapleura greenish-yellow.

Superior appendages, in profile view, with the upper margin strongly convex and semicircular, apex with no acute recurved tooth, each appendage constricted in its basal third on the lower side, which is then abruptly dilated beyond, showing no tooth in profile view; but in a supero-internal view an acute not recurved tooth (Selys says "dent arrondie") is visible at mid-length of the inner-lower margin.

Front wings with 9 postnodals (9–11 Selys), hind wings with 8–9.

♀. Unknown to me. Selys describes no prothoracic processes, no dorsal dark markings on abdominal segments 1 and 2, and states of the "valvules vulvaires . . . depassant un peu l'abdomen." (Cf. *T. sanguinalis*, *postea*.)

Abdomen ♂ 25.5 (23–26, ♀ 23–25, Selys); hind wing ♂ 16 (15–17, ♀ 15.5–18 Selys) mm.

Habitat: — BRAZIL, Bahia, 1 ♂ ex coll. Winthem. Museum of Comparative Zoölogy, Cambridge, Maas.

Selys' material was from S. Joas del Rey, Santa Cruz, and the Province of Rio.

96. **Telebasis carmesina** sp. nov.

(PLATE V, FIGS. 100, 100*a*.)

♂. Transverse reddish occipital stripe not enlarged into a spot on each side. Labrum bluish-green.

Middle of the front lobe, posterior part of the middle lobe and the entire hind lobe of the prothorax dark green. Mid-dorsal thoracic carina reddish, the dark metallic-green stripe on each side of the carina three-fifths to three-fourths as wide as the mesepisternum on which it lies, remainder of mesepisterna and mesepimera reddish, metapleura yellowish.

Superior appendages, in profile view, with the upper margin strongly convex, descending more abruptly and more vertically at the hind end to form an apical margin, which by its junction with the lower margin forms a subacute recurved tooth; difference in thickness between the proximal third and the remainder of the appendage less than in *T. corallina*, but with a moderately acute recurved tooth at one-third length on the lower margin, visible in profile as well as in supero-internal view.

Front wings with ten postnodals (nine on one wing), hind wing with nine (eight in one wing).

Abdomen 22, hind wing 14–15 mm.

♀ unknown.

Habitat: — BRAZIL, Sete Lagoas in Minas Geraes, May 4, 1908, by J. D. Haseman, 1 ♂. Chapada, by H. H. Smith, 1 ♂ numbered 144. Carnegie Museum, Pittsburgh.

A male from Saõ Paulo, Brazil, by A. Hempel (Academy of Natural Sciences of Philadelphia), taken September 14, 1900, has the occipital stripe, the prothorax and the dark metallic-green mesepisternal stripes as in *T. corallina*, the labrum yellow, the superior appendages as in *T. carmesina,* 10 postnodals on the front wing, 8 on the hind, abdomen 22.5 mm., hind wing 16 mm.

97. **Telebasis sanguinalis** sp. nov.

(PLATE V, FIG. 101.)

♂. Transverse reddish occipital stripe enlarged, or not enlarged, on each side into a reddish spot. Labrum bluish-green.

Prothorax with a metallic-green spot on the middle of the front lobe, middle lobe with a mesially convex metallic-green stripe on each side of its dorsum, or the dorsum dark metallic-green with a reddish spot on each side; hind lobe dark metallic-green with yellow margins. Mid-dorsal thoracic carina reddish, the dark metallic-green stripe on each side of the carina one-third to two-fifths as wide as the mesepisternum on which it lies; remainder of mesepisterna and mesepimera reddish; metapleura pale bluish or yellowish.

Superior appendages, in profile view, with the upper margin moderately convex, its proximal half almost straight, its distal half not descending abruptly, no constriction or teeth on the almost straight lower margin visible in the ordinary resting position, but on raising the superiors the extreme base of the lower margin is seen to be abruptly constricted, an acute infero-internal forwardly-directed tooth marking the beginning of the enlargement, apex rounded.

♀. Transverse reddish occipital stripe enlarged on each side into a spot which is quite large in some. Labrum yellowish.

Prothorax pale reddish-brown or reddish-yellow, hind lobe with two slender thin processes directed forward and applied for their whole length against the dorsal surface of the middle lobe reaching to one-half of its length.

Thoracic dorsum and abdomen less red, more yellow; a mid-dorsal blackish spot on abdominal segment 1; a fine blackish or brown mid-dorsal line on 2 connecting a mid-basal spot with a transverse brownish streak at three-fourths' length. Hind margin of 10 cleft mid-dorsally to more than half-way toward base. Appendages as long as 10. No vulvar spine on 8. Genital valves hardly reaching the level of the hind end of 11.

♂♀. Front wings with 8–10 postnodals (9 most frequent); hind wings with 7–8 (8 most frequent).

Abdomen ♂ 21–23, ♀ 23–24; hind wing ♂ 14–15, ♀ 15.5–16.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 9 ♂ and parts of 14 others, 4 ♀; some numbered 10, 44, 82 or 144 by the collector. Carnegie Museum, Pittsburgh.

One male has the dark metallic-green of the upper surface of the head extending well down on the rear, thereby reducing the area of yellow.

98. **Telebasis coccinata** sp. nov.

(PLATE V, FIGS. 103, 103*s*.)

♂. No transverse reddish occipital stripe, red line between each lateral ocellus and the antenna of the same side very fine or wanting. Labrum bluish-green.

Prothorax dark metallic-green, middle lobe pale blue inferiorly, extreme hind margin of hind lobe reddish.

Mid-dorsal thoracic carina black (or reddish in two specimens), the dark metallic-green stripe on each side of the carina two-thirds to four-fifths as wide as the mesepisternum on which it lies; remainder of mesepisterna and adjacent part of mesepimera reddish, but most of mesepimera and metapleura pale blue.

Abdominal segment 1 blue on the sides.

Superior appendages, in profile view, with the upper margin gently curved downward in the distal three-fourths to meet the almost straight lower margin in a subacute apex.

Front wings with 9–11 postnodals, hind wings with 8–9 (8 most frequent).

Abdomen 20.5–21.5, hind wing 13–14.5 mm.

♀ unknown.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 2 ♂ and parts of 2 others, some dated May. Carnegie Museum, Pittsburgh.

Minas Geraes, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

99. **Telebasis carminita,** sp. nov.

(PLATE V, FIG. 102.)

♂. Transverse reddish occipital line present, slender. Labrum bluish-green.

Prothorax as in *T. coccinata.*

Mid-dorsal thoracic carina reddish, the dark metallic-green stripe on each side of the carina covering from three-fourths to nearly all of the mesepisternum on which it lies, leaving only a reddish line bordering the lower three-fourths of the humeral suture, mesepimera reddish, metapleura bluish.

Superior appendages, in profile view, triangular, upper margin slightly convex, almost straight, apical margin slanting ventrad and cephalad, forming a recurved tooth where it meets the concave lower margin, appendage much narrower at base than at one-third length.

Front wings with 8 or 10 postnodals, hind wings with 7.

Abdomen 18–18.5, hind wing 11.5 mm.

♀ unknown.

Habitat: — BRAZIL, Cuyabá, 1 ♂; Cachoeiro Cuyabá, flooded campo, January 26, 1 ♂, no. 9. Both by H. H. Smith. Carnegie Museum, Pittsburgh.

100. **Telebasis coccinea.**

Erythragrion coccineum Selys, Bull. Acad. Belg. (2) xlii, p. 965. 1876.
Telebasis coccinea Kirby, Cat. Odon. p. 155. 1890.

Not known to me; the following is drawn from de Selys' description.

♂. No transverse reddish occipital stripe.

Labrum orange-red.

Prothorax bronze-black except a large orange spot on the sides.

Mid-dorsal thoracic carina black, the bronze-black stripe on each side of the carina covering all of the mesepisternum on which it lies, except for an orange ray on the humeral suture.

Superior appendages, in profile view, compared with those of *T. corallina* "appear narrower at the base and their inferior dilatation much less wide."

♀. Occipital stripe and labrum as in the ♂.

Prothorax brown.

Mid-dorsal thoracic carina black, the mesepisternal black stripe not covering all of that sclerite.

Abdominal dorsum obscure olive-brown, narrower on 9, absent on 10; articulations, ventral surface, all of 10, and the appendages reddish.

Abdomen ♂ 20–21, ♀ 23.5; hind wing ♂ 13.5–14, ♀ 16 mm.

BRAZIL, Minas Geraes.

TIGRIAGRION[24] genus novum. (Legion *Agrion* Selys.)

Arculus at, or very near to, the second antenodal; M_2 (= nodal sector, Selys) on the hind wings arising nearest the fourth postnodal; costal edge of the stigma of the hind wings shorter than the proximal or distal edges; Cu_1 and Cu_2 (= upper and lower sectors of the triangle) not reaching as far distad as the levels of origin of M_{1a} and M_2 (= ultranodal and nodal sectors); A (= lower or inferior sector of the triangle) separating from the hind margin proximal to, or less frequently at, the cubito-anal cross-vein (= basal postcostal), which is situated nearer to the level of the first than to that of the second antenodal; venation of the tips of front and hind wings similar, abdomen chiefly red, tenth segment of the male not elevated dorsally, vulvar spine?

Type: *Tigriagrion aurantinigrum*, sp. nov.

101. **Tigriagrion aurantinigrum,** sp. nov.

(PLATE V, FIGS. 104, 105; PLATE VIII, FIG. 143.)

♂. Head and thorax orange-red, with the following black markings: a line on the fronto-nasal suture; a transverse frontal line; a narrow ring almost encircling each ocellus; a fine ring surrounding the three ocelli, giving off on each side a stripe toward, but not to, the antenna, and confluent with a transverse stripe behind the lateral ocelli, which stripe is prolonged at each end obliquely forward to the eye of the same side; a curved stripe on each side (confluent or not confluent with the transverse stripe) almost surrounding, except on the inner (mesial) side, an orange area corresponding to the pale postocular spot of allied genera, this area dotted with black; most of the middle prothoracic lobe (leaving a pair of short median lines and a larger spot on each side orange); a stripe on each side of the mid-dorsal carina (which remains orange) two-fifths as wide at mid-height as the mesepisternum on which it lies; a much narrower antehumeral stripe reaching downward from the upper end of the humeral suture half to three-fifths of the way to the lower end of the sclerite, or absent, except at the upper end of the humeral suture; a mesepimeral stripe half as wide as its sclerite, usually confluent above with the antehumeral, not touching the humeral suture in most of its length, and continued across the mesinfraepisternum, on which it is narrower; a short mark at the upper ends of the obsolete first and of the second lateral thoracic sutures, and smaller isolated marks or dots below these in some specimens.

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[24] From τίγρις and Agrion, in allusion to the black and orange markings of the head and thorax of the type species. The nearest ally of *Tigriagrion* is perhaps *Telebasis* (Selys) Kirby (= *Erythrogrion* Selys).

Dorsum of abdominal segments 1–10 black, the black widening on the sides at the apices of 3–5; the intersegmental articulation of 1 and 2, a narrow transverse basal ring on 3–7, and an indistinct mid-dorsal spot on 9, yellow; sides inferiorly and ventral surfaces of the abdominal segments orange. Hind margin of segment 10 with a small semicircular mid-dorsal excision, but not at all elevated.

Superior appendages shorter than 10, blackish, in dorsal view rather distant, moderately divergent (in specimens in which no attempt to arrange them for easy inspection has been made), narrower at the obtuse apex than at the base; in profile view directed caudad, but only slightly ventrad, straight, each one about twice as long as thick at the middle, apex obtuse.

Inferior appendages in profile view twice as thick at base as are the superiors, apical half much slenderer, directed upwards, slightly recurved and hooked at the extreme apex, which reaches to the level of three-fifths of the length of the superiors; in ventral view pale brownish-yellow, the slender apical half forming a process on the outer edge and curved somewhat toward its fellow of the opposite side.

Legs orange, all the femora and tibiæ anteriorly and much of each tarsus black, 6–7 spines in the anterior row of the third tibia.

♀. Differs from the description of the male as follows: black antehumeral stripe faint, except the spot on the upper end of the humeral suture from which it starts, mesinfraepisternal continuation of the mesepimeral stripe hardly narrower. (Abdominal segments 7–10 lost.) Hind margin of the prothorax in both sexes low, convex, entire.

♂♀. Wings clear, stigma brownish-yellow, surmounting less than one cell, distal edge distinctly convex and forming a much less acute angle with the costa than does the proximal side, stigma of the hind wing larger than that of the front, its costal edge shorter than the proximal or distal edge; on the front wings the costal edge varies from longer to shorter than the proximal or distal edge, no one proportion existing in a majority of the specimens. Anal vein separating from the hind margin of the wings proximal to the cubito-anal cross-vein in the greater majority of cases, but at a varying distance. Postnodals on the front wings 8–9 (8 more often), on the hind wings 6–8 (7 more often); M_2 on the hind wings arising nearest the fourth postnodal (90 per cent.).

Abdomen ♂ 18.5–20.5, ♀ ?; hind wing ♂ 12–13, ♀ 13.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 4 ♂ and parts of 5 ♂, 1 ♀, numbered 43 by the collector, one male dated May. Carnegie Museum, Pittsburgh.

Genus METALEPTOBASIS.

Calvert, Biol. Centr.-Amer. Neurop., p. 386. 1907.

Additional material indicates that the character drawn from the anal vein (= inferior sector of the triangle of de Selys) as originally given for this genus is variable. The other diagnostic features hold true, viz.: M_2 (= nodal sector of de Selys) arising nearest the fifth or sixth postnodal on the hind wings, the sixth or more remote on the front wings, tarsal claws toothless, superior appendages of the male not bent down almost at a right angle in their apical half, genital valves of the females not reaching far beyond the level of the tips of the abdominal appendages.

102. **Metaleptobasis diceras.**

(PLATE VI, FIGS. 106, 107, 114.)

Leptobasis diceras Selys, Bull. Acad. Belg. (2) xliii, p. 102. 1877.

♂. The male described by de Selys (from Para) lacked the last four abdominal segments. The following notes are added from a male of what seems to be the same species:

Abdominal segment 7 similar to 6, *i. e.*, pale brown, darker at the hind end, perhaps with metallic-blue reflection in an older stage; 8–10 pale (blue?), the three together (3 mm.) only three-fifths as long as 7. Hind dorsal margin of 10 entire, very slightly elevated in the middle.

Superior appendages slightly shorter than 10, in dorsal view curved regularly toward each other, each decreasing slightly in width from base to the obtusely truncated apex; in profile view, each appendage is nearly horizontal, slightly contracted at mid-length, gradually thickened to the apex, which is a little thicker than the base and truncated from above downward (ventrad) and backward (caudad), but not so obliquely as to produce an acute apex.

Inferior appendages in profile view conical, directed slightly upward and reaching to mid-length of the superiors; in ventral view each appendage, otherwise pale yellow, has an inner acute apical straight black edge.

Postnodals on the front wings 12, on the hind 11; M_2 (= nodal sector) arising nearest the sixth postnodal on both front and hind.

Abdomen 38.5, hind wing 22 mm.

Habitat: — BRAZIL, Bahia, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

See also the remarks under *M. bicornis.*

103. **Metaleptobasis bicornis?**

(PLATE VI, FIGS. 108, 109.)

Leptobasis bicornis Selys, Bull. Acad. Belg. (2) xliii, p. 103. 1877.

This species was described from a single female. A male which I provisionally refer here lacks the last four abdominal segments and differs from the description of the female as follows:

Hind margin of prothorax low, very feebly trilobed, lobes subequal. Each mesepisternum bears a slender straight horn directed laterad and hardly at all cephalad or dorsad, thus differing from the similar processes of *M. diceras* and of *M. bovilla*[25] from Nicaragua, as in *M. diceras* each horn is directed laterad, dorsad, and cephalad, the last more especially in its distal half, and in *M. bovilla* each process is "directed forward [cephalad] and upward [dorsad] . . . subparallel with its fellow of the other side for half its length, then diverging therefrom and curved outward (laterad)."

Mid-dorsal thoracic band of the same width (.32 mm.) as in *M. diceras* ♂ above described, but metallic-green instead of metallic-blue.

Quadrilateral on the front wings with the anterior side two-fifths as long as the posterior, (not two-thirds as de Selys says, but a comparison of his statement for the same parts on the hind wing suggests that this may be an error), 11 postnodals on all the wings, M_2 arising nearest the sixth on the front wings, the fifth on the hind.

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[25] Calvert, Biol. Centr.-Amer. Neuropt., p. 386, pl. vii, figs. 21–23. 1907.

Abdominal segments 1–6, 29 mm., hind wing 21.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 1 imperfect ♂ numbered 190 by the collector. Carnegie Museum, Pittsburgh.

104. **Metaleptobasis cornicauda** sp. nov.

(PLATE VI, FIGS. 110, 111.)

♂. Dark metallic-blue or green, the following pale yellow: rhinarium, genæ below the level of the frons, a narrow stripe on the site of the obsolete first lateral thoracic suture not reaching to the wing bases, a shorter similar stripe bordering the lower half of the posterior margin of the metepisternum, these two stripes confluent below with the yellow of the pectus, a dot near the upper end of the sclerite, nearly all the metepimeron (except for a blackish mark in the middle of its lower half), pectus (except for a mid-ventral longitudinal black stripe and a black metasternal stripe bordering the latero-ventral metathoracic carina), much of the ventral surfaces of abdominal segments 1–7 (except the hind end of each) confluent with a narrow transverse mid-dorsally interrupted basal yellow ring on at least 4–6, coxæ posteriorly and mesially, tibiæ superiorly.

Hind prothoracic margin low, convex, entire, no pro- or mesothoracic horns.

Tenth abdominal segment twice as long dorsally as ventrally, its dorsal length half that of 9, middle of the hind dorsal margin produced dorsad and caudad to form a triangular process, best seen in rear view, and then having a rounded tip, but viewed dorsally the tip is bifid.

Superior appendages stout, in dorsal view a little longer than 10, subparallel, and each of subuniform width in the proximal two-thirds, widened in the distal third, especially on the inner (mesial) side, curved toward each other, apex truncated obliquely from within caudad and laterad. Each appendage is for its entire length concave within and convex without, and in profile view its outline is capitate, the "head" occupying about the distal half.

Inferior appendages in profile view conical, directed straight caudad, apices acute, and reaching to the level of one-third of the length of the superiors; in ventral view the acute apices are curved slightly toward each other.

Third tibia with 6 spines in the anterior (outer) row.

Wings clear, stigma brown, margined with a pale line inside the bounding veins, surmounting one cell, proximal edge more oblique than the distal, posterior edge the longest, costal edge next in length. Anterior side of the quadrilateral two-fifths (front wings) or three-fifths (hind wings) as long as the posterior side. Front wings with 16 postnodals, M_2 arising nearest the seventh; hind wing with 14 postnodals, M_2 arising nearest the sixth. Anal vein separating from the hind margin distal to the cubito-anal cross-vein by a distance less than the length of that cross-vein, which is situated nearer the second than the first antenodal.

The single individual at hand is pruinose on the ventral surface and inferiorly on the sides of the thorax, on the coxæ, and on abdominal segments 9 and 10.

Abdomen 50 mm., hind wing 27 mm.

♀ unknown.

Habitat: — BRAZIL, Bahia, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

M. cornicauda is allied to *Leptobasis macilenta* (Rambur) Selys, which probably is also a *Metaleptobasis.* The description of *macilenta* refers to a much smaller insect (abd. 35, hind wing 19.5 mm.) with fewer (12–13) postnodals, border of segment 10 deeply excised in the shape of a broad V, and superior appendages thicker at the base than elsewhere; its habitat is no more definite than "Brésil."

105. **Leptobasis vacillans** Selys.

Leptobasis vacillans Selys, Bull. Acad. Belg. (2) xliii, p. 101. 1877. Calvert, Biol. Centr.-Amer. Neurop. pp. 120, 385, pl. v, figs. 22–25. 1902, 1907.

What appears to be this species, hitherto not recognized in South America, is represented by specimens from Paramaribo having darker colors on parts of the body, perhaps as the accompaniment of greater maturity, than existed in material previously described.

♂♀. Dorsum of the abdomen marked with bronze-green as follows: hindmost fifth of 4 and nearly all of 5–7, except a narrow transverse basal mid-dorsally interrupted yellow ring on each, and the hind end of 7, which is reddish. One male, moreover, has most of the nasus (leaving its free margin pale blue or green), the frons superiorly (but not inferiorly) and the vertex superiorly blackish, the last with some reddish reflection; and on each side a moderately sized blue postocular spot widely confluent with the blue of the rear of the head; the other male and one female have the head entirely reddish superiorly. The other female has the nasus and the upper surface of the head olive, with blue postocular spots as above described, and the dark markings on the abdominal segments are merely dull brown. Neither female has a vulvar spine, but the posterior ventral margin of 8 is convex. Abdomen ♂ 26.5–27.5, ♀ 27; hind wing ♂ 14.5–15, ♀ 17 mm.

Habitat: — DUTCH GUIANA, Paramaribo, by Miss Katherine Mayo, 2 ♂, 2 ♀. Academy of Natural Sciences of Philadelphia.

Specimens from Ecuador also appear referable to this species, but have a greater extension of dark colors:

♂♀. Dorsum of abdominal segments 4–7 dark metallic-green, except for a narrow transverse mid-dorsally interrupted basal yellow ring on each and, in some at least, the hind end of 7, which is reddish. The head is a little wider (3.12–3.44) than in typical *vacillans* from Cuba and Guatemala (2.72–2.88 mm.), the examples from Paramaribo being intermediate in this respect (3–3.12 mm.). One of the three females has a very minute vulvar spine, the other two lack this feature, but the posterior ventral margin of 8 is strongly convex in all three.

Abdomen ♂ 28–29, ♀ 27.5–28.5; hind wing ♂ 15–16, ♀ 17 mm.

Habitat: — ECUADOR, Guayaquil, 5 ♂, 2 ♀, and Quevedo, 5 ♂, 1 ♀, all by Prof. F. Campos R. Academy of Natural Sciences of Philadelphia.

If it be desirable to distinguish these forms of *vacillans* by subspecific names (and of this I am not yet assured), those of *guianæ* and *ecuadorica* may be suggested.

106. **Leptobasis mammilaris** sp. nov.

(PLATE VI, FIGS. 112, 113, 115–117.)

♂. Dorsum of head and of thorax reddish-yellow, the following pale green or blue: genæ, rear of head, antehumeral stripe (one-fourth to one-fifth as wide as its mesepisternum), and a stripe on the metepisternum and adjacent part of the mesepimeron; labium, metepimera, and pectus pale yellow.

Hind margin of prothorax trilobed, median lobe widest and most prominent, rounded, but not greatly produced.

Mesostigmal laminæ well, but not excessively, developed, vertical. Behind each lamina on the anterior or lower end of each mesepisternum is a distinct rounded tubercle, situated between the fork of the anterior end of the mid-dorsal carina and the pale green antehumeral stripe.*

Abdomen brownish-yellow, a little darker dorsally, especially on segment 7; hindmost eighth of 3–6 darker brown, a fine black transverse ring on the intersegmental articulations of 3–6. A pale green lateral longitudinal stripe on 1 and 2 of the damaged male only. Hind margin of 10 neither excised, nor elevated.

Superior appendages half as long as 10, in dorsal view appearing as reddish rounded tubercles; in profile view the upper margin is straight, ascending, apex wider than base and prolonged downward (ventrad) in a long acute perpendicular process.

Inferior appendages reddish-yellow, in profile view straight, slender, acute, reaching half again as far beyond the level of the superiors, extreme apex black; in ventral view each appendage is curved somewhat toward its fellow of the opposite side.

Legs yellow, spines black, 6 in the anterior (outer) row of the third tibia, tooth of the tarsal nails very small.

Wings clear, veins brown, stigma pale grayish-brown, surmounting considerably less than one cell, distal edge more oblique than the proximal and convex, costal edge longest. Quadrilateral of the front wings with the anterior side subequal to the proximal and less than half as long as the posterior side; of the hind wings with the anterior side half as long as the posterior. Anal vein (= inferior sector of the triangle of de Selys) separating from the hind margin distal to the cubito-anal cross-vein by a distance equal to or less than the length of the cross-vein itself, this cross-vein placed nearly midway between the levels of the two antenodals. Postnodals on the front wings 10, on the hind 9.

♀. An individual from Rio de Janeiro may belong here, and differs from the preceding description of the male as follows: Hind margin of prothorax not trilobed; but produced medially and bilobed; mesostigmal laminæ nearly horizontal, projecting forward, the antero-external angle rounded; no mesepisternal tubercles; dorsum of abdominal segments 3–7 dark brown (except for a mid-dorsally interrupted pale basal ring); widened down on the sides in the hindmost sixth of 3–6; 2 with a mid-dorsal brown line stopping at a transverse brown line at four-fifths of the length of the segment; abdominal ap-

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*This tubercle is placed not quite as far laterad as the mesepisternal tubercle of females of certain species of *Argia*. (Cf. *Biol. Centr.-Amer.*, *Neurop.*, p. 68.)

pendages a little shorter than 10, straight, simple, apices acute, hind margin of 10 moderately elevated mid-dorsally, when viewed from the rear; 8 postnodals on the hind wings.

No vulvar spine, although the posterior ventral margin of 8 is strongly convex. Genital valves 1.8 mm. long (excluding "palps"), reaching beyond the level of the tips of the abdominal appendages.

Dimensions: abdomen ♂ 28.5, ♀ 29; hind wing ♂ 16, ♀ 19.5 mm.

Habitat: — BRAZIL, Chapada, 1 ♂ and part of 1 other; Rio de Janeiro, 1 ♀, all by H. H. Smith. Carnegie Museum, Pittsburgh.

107. **Amphiagrion titicacæ**, sp. nov.

(PLATE VI, FIGS. 118–120.)

♂. Head and thorax brownish-yellow, the latter reddish-brown in older stages, the following black: antennæ beyond the third joint, central portion only of the upper surface of the head (leaving the area between the three ocelli and a narrow stripe from each lateral ocellus toward the antenna of the same side yellow), or the black may extend out to the eyes as well as obliterate the yellow ocellar-ocular stripe, a mark on each side of the middle lobe of the prothorax, the small area between the mesostigmal laminæ, a line on the upper end of the humeral suture. Lips, underside of head and of thorax, a more greenish-yellow.

Median third of hind margin of prothorax produced caudad and dorsad, and truncated, or slightly bilobed. A prominent, rounded, hairy metasternal tubercle.

Head, thorax, legs (in addition to the usual biserial black spines), and ventral surface of the first three abdominal segments with many long soft hairs, whitish on the underside of the head and on parts of the legs, brownish elsewhere.

Dorsum of abdominal segments 1–6 coral-red, of 7–10 blue, the following black: a fine transverse ring at most of the intersegmental articulations, a transverse stripe (interrupted or absent in some) at three-fourths of 3 and of 4, a wider similar curved band (or very small in some) on the same part of 5, the hindmost third or fourth of 6, a longitudinal lateral stripe on the posterior two-thirds or half of 7 and for the whole length of 8–10, which stripe sends up a slender vertical branch at three-fourths' length of 7 and at nearly mid-length of 8 and

9, while on 10 it, with its ascending branches, encloses a round, blue spot on each side of the dorsum, or the two spots are confluent. 3–6 have a narrow transverse basal yellow ring and the sides inferiorly of most of the abdominal segments are yellow, more obscure nearer the hind end of the abdomen.

Hind margin of 10 with a small mid-dorsal excision, not elevated. Superior appendages subequal in length to 10, reddish, hairy, in dorsal view conical, apex subacute, and, owing to the hairs, having the appearance of being slightly incurved; in profile view each is somewhat mitten-shaped, the "thumb" being represented by an inferior process, directed caudad, at about three-fifths of the length.

Inferior appendages in profile view conical, directed somewhat upward as well as caudad, not quite reaching to the level of the tips of the superiors, yellow; in ventral view the outer side is prolonged to form the chief part of each appendage, and is curved slightly toward its fellow of the opposite side, with a small blackish hook on the mesial side at apex.

Legs brownish yellow, 7 spines in the anterior row of the third tibia, tooth of the tarsal nails very small.

Wings clear, veins brownish-yellow, stigma yellow, moderately oblique, surmounting one cell or less, rather distant proportionally (2 mm.) from the wing-tip, costal edge longer than the proximal or distal edge on the hind wing and often also on the front wing. Anal vein separating from the hind margin of both front and hind wings at least as far proximal to the cubito-anal cross-vein as the latter is long; 8–10 (10 most frequent) postnodals on the front wings, 6–8 (8 most frequent) on the hind. M_2 on the hind wings arising nearest the fourth or third postnodal.

♀. Differs from the description of the male as follows: Hind margin of prothorax trilobed, median lobe not as prominent as the corresponding part of the male; dorsum of abdominal segment 10 elevated into a median ridge; appendages reddish or yellowish, as long as 10; vulvar spine present, genital valves pale, reaching caudad not beyond the level of the hind end of 10; 7–10 postnodals on the front wings, 9 most frequent; 6–8 on the hind wing, 8 most frequent.

The differences in color between the two sexes are confined to the abdomen, but the females show differences among themselves by which, as in other genera, they may be grouped as similar to, or markedly different from, the males in abdominal markings.

Homœochromatic females have the abdomen colored similarly to that of the males, differing as follows: a transverse mid-dorsally interrupted black stripe similar to that on 3 and 4 may be present at three-fourths' length of 2; posterior dorsal fourth to two-fifths of 5 black, in one with a fine mid-dorsal prolongation reaching forward to one-fourth length of the segment from the base; posterior dorsal three-fifths to four-fifths of 6 pointed anteriorly; the lateral longitudinal black stripe on 7 occupying only the hindmost third or fourth, on 8 only the posterior three-fourths to three-fifths, on 9 only the anterior three-fifths; or, 9 may be blue, with a black stripe on each side of the *dorsum* for the entire length of the segment, this black stripe wider than in the male, narrowing posteriorly and with no vertical branch; or, 9 may be black dorsally, with a median pale line; 10 pale, with a transverse basal dorsal black stripe, or black dorsally, with a pale mid-dorsal line.

Heterochromatic females have the abdomen colored quite differently from the male, as follows: Dorsum of segments 1–6 reddish-yellow, the following markings black: a basal dorsal spot on 1, a hastate spot pointed anteriorly occupying the entire length or nearly so, of 2–4, the point abbreviated on 2 in some; the posterior four-fifths to five-sixths of 5 and three-fourths to four-fifths of 6; or 6 may have but little more than the posterior half black, including a forwardly tapering acute mid-dorsal prolongation. 7 blue, its hindmost half to third black, sending forward three slender branches, one median and shorter, the other two lateral and longer; or the median branch may be wanting and the laterals very short; or only the hindmost fourth of 7 may be black, with no forwardly-directed branches. 8 black, or black with a transverse basal blue ring; or this ring enlarged to occupy the anterior two-fifths of the length of the segment, but interrupted mid-dorsally with black; or 8 blue, with a pair of dorsal black spots occupying the posterior three-fifths. Dorsum of 9 black, with a mid-dorsal blue spot; or blue, with a black stripe on each side as long as the segment, or reaching from the anterior end three-fourths of the way to posterior end. 10 black dorsally, or with a median pale spot, or nearly as described for the male; or blue, with only a slight trace of black on each side at base. Sides of 1–10 reddish-yellow, more red and less yellow on the posterior segments.

Dimensions: Abdomen ♂ 18.5–20.5, ♀ 18–20.5; hind wing ♂ 14.5–16, ♀ 15–17 mm.

Habitat: — PERU, Puno, November 1–3, 1898, by Wm. J. Gerhard, 14 ♂, 2 homœochromatic ♀, 14 heterochromatic ♀. Academy of Natural Sciences of Philadelphia.

Puno, by Garman, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

BOLIVIA, Chililaya, November 5, 1898, by Wm. J. Gerhard, 8 ♂, 1 homœochromatic ♀, 8 heterochromatic ♀. Academy of Natural Sciences of Philadelphia.

Both of these localities are on Lake Titicaca and therefore at an elevation of 12,500 feet[26] (3711 metres) above the sea, one of the highest altitudes from which Odonata have as yet been reported.

This is the first species of *Amphiagrion* known from South America. It resembles the type of the genus *A. saucium* (Burm.) of North America, not only by positive characters set forth in the most recent limitation of the genus,[27] but also in the variability of the point of origin of M_2 (= nodal sector of de Selys) on the hind wings. Ten males, ten females of *A. titicacæ* from Puno have this origin at the fourth postnodal in 55 per cent. ♂, 45 per cent. ♀; at the third in 35 per cent. ♂, 50 per cent. ♀; and mid-way between third and fourth in 10 per cent. ♂, 5 per cent. ♀.[28]

A. titicacæ differs from *A. saucium* by its less oblique pterostigma, the presence of blue on the posterior abdominal segments, the shape of the abdominal appendages of the male, etc.

108. **Ischnura ? nepos** Selys.

(PLATE VI, FIGS. 121, 122.)

Agrion ? nepos (Bates Mss.) Selys, Bull. Acad. Belg. (2) xli, p. 1249. 1876.

♀ (hitherto unknown); (homœochromatic). Differs from de Selys' description of the male as follows: Pterostigma ochre; blue postocular spots circular; black on the dorsum of abdominal segment 9 divided into two separate or confluent spots, reaching from base to mid-length of the segment; dorsal surface of 10 (which is pale in some) almost carinate medially; appendages shorter than 10, straight, simple, pale or dark; 8 with a well developed vulvar spine; genital valves reaching to the level of the hind end of 11 (anal tubercle); femora brown superiorly.

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[26] Intercontinental Railway Commission quoted by Gannett, Bull. Internat. Bureau Amer. Republ. Sept. 1904, p. 51.

[27] Calvert, Biol. Centr.-Amer. Neurop. p. 102. 1902.

[28] Compare Calvert, *l. c.*, p. 102, footnote †.

In females, which appear to be older, the labrum is black, with only its extreme free margin pale; the postocular spots are indistinct, and the pale narrow antehumeral stripes have disappeared.

♀ (heterochromatic *a*). Upper surface of head and of thorax dull yellowish, with here and there some reddish tinge, especially on the thoracic dorsum; the following black: a narrow stripe along the base of the labrum; a marginal stripe on the nasus, which almost completely surrounds the yellowish disk, except at the middle of the anterior border; a transverse stripe from eye to eye immediately behind the antennæ and enclosing the anterior (median) ocellus and three yellowish or orange points, one in front and one on each side of the ocellus; a second more sinuous transverse stripe from eye to eye just behind the two lateral ocelli; hind surface of the second joint and all of the remaining distal joints of the antennæ; a short line on the upper ends of the humeral and of the second lateral thoracic sutures. The circular blue postocular spots confluent with the pale color of the rear of the head. Apparently a pale green antehumeral line on the reddish-yellow thorax. Abdomen as in the homœochromatic female.

♀ (heterochromatic *b*). Like heterochromatic *a*, but the dorsum of abdominal segment 9 is black, 10 being either black or pale above; in one example there is a posterior brown border to the blue postocular spots.

♀ (heterochromatic *c*). The two transverse stripes on the top of the head fused, leaving only yellowish dots or short lines between them (*i. e.*, between the median and the lateral ocelli); a brown posterior border to the blue postocular spots; a black stripe on each side of the mid-dorsal thoracic carina (which is reddish) half as wide as the mesepisternum on which it lies; an isolated black streak on the mesepimeron close to the humeral suture. (Nearly all the abdomen is lost.)

♂♀. Anal vein (=inferior sector of the triangle of de Selys) separating from the hind margin proximal to the cubito-anal cross-vein (= postcostal nervule of de Selys) on the *front wings* by as much (25 per cent. ♂, 37 per cent. ♀), or by less than as much (75 per cent. ♂, 58 per cent. ♀), as the length of the cross-vein itself; on the *hind wings* separating from the hind margin proximal to the cross-vein by less than the latter's length (17 per cent. ♂, 25 per cent. ♀), or at the cross-vein itself (83 per cent. ♂, 75 per cent. ♀).

Postnodals on the front wings (7–8) ♂, 7–10 (8) ♀; on the hind wings 5–7 (6) ♂, 6–7 (7) ♀; the numbers in parentheses the most frequent. M_2 (= nodal sector of de Selys) arising nearest the third (75 per cent. ♂, 58 per cent. ♀), midway between the third and fourth (8 per cent. ♂, 21 per cent. ♀), or nearest the fourth (16 per cent. ♂, 21 per cent. ♀) postnodal.

The pterostigma is a most characteristic feature of this species, the costal edge being shorter (100 per cent. ♂♀) than the proximal or distal edges, and often also than the posterior edge; the distal edge decidedly convex and forming a much less acute angle with the anterior margin of the wing than does the proximal edge.

(All the above percentages based on 6 ♂, 12 ♀.)

Dimensions: Abdomen ♂ 16–18, ♀ 16–19.5; hind wing ♂ 10.5–11.5, ♀ 11–13.5 mm.

Habitat: — BRAZIL, Marajo Island, August–October, 1907, by Miss Harriet Merrill, 1 ♀ and parts of 1 ♂, 1 ♀. Academy of Natural Sciences of Philadelphia.

Cuyabá, 1 ♂, 1 ♀ hom.,[29] 1 ♀ het.[30] *a*, 1 ♀ het. *b*; Cachoeira 1 ♀ hom., no. 38; Cachoeira Cuyabá, flooded campo, January 26, 1 ♂ and parts of 1 ♂, 1 ♀ het. *b*, 1 ♀ het., no. 19; id., parts of 1 ♂, 1 ♀ het. *c*; Chapada, 1 ♀ hom.?; Uacaryzal, 1 ♀ hom. and parts of 2 ♀ hom.; Corumbá, 2 ♂, 1 ♀ hom.; all by H. H. Smith. Carnegie Museum, Pittsburgh.

BOLIVIA, Piedra Blanca, April, by H. H. Smith, 1 ♂ and part of 1 other specimen. Carnegie Museum, Pittsburgh.

PARAGUAY, Concepcion, by H. H. Smith, part of 1 ♂. Carnegie Museum, Pittsburgh.

In describing this species from a single male, taken by Bates on the Amazon, de Selys remarked: "Si la femelle possédait une épine vulvaire, on pourrait considérer le *nepos* comme un Ischnura aberrant. Elle a, en effet, des rapports avec ce groupe, non seulement par sa petite taille et sa coloration, mais encore par la différence du ptérostigma aux quatre ailes, les appendices supérieurs branchus à la base, et le bout du 10ᵉ segment un peu relevé et bituberculé." Now that the existence of a vulvar spine is known, there might be added to the evidence adduced by de Selys in favor of the Ischnurine affinities of this species, the apparent existence of dimorphic females.

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[29] hom. = homœochromatic.

[30] het. = heterochromatic.

On the other hand it must be pointed out that the difference between the pterostigmata of the front and hind wings of the males is much slighter than in males of *Ischnura* and perhaps than in de Selys' type of *nepos;* in some examples there is no difference in size and very little in shape, and in all there is no difference in color. The shape of the pterostigma is less oblique than in *Ischnura* and is not unlike that of *Acanthagrion truncatum.* The more distally situated point of separation of the anal vein from the hind margin, especially on the hind wings, is a divergence from Ischnurine characters, and so also is the tendency of M_2 in so many hind wings to arise at a point more remote than the third postnodal. The shape of the superior appendages of the male (aside from the existence of the "branche interne") is not Ischnurine, nor on the other hand does it resemble those of the males of de Selys' "seconde section" of *Acanthagrion,* a reference suggested by the venational characters. Further, it is not certain whether the females above described as heterochromatic may not, to some extent, represent different stages in development rather than true dimorphs.

On the whole, however, it seems best to adopt provisionally de Selys' suggestion and consider *nepos* an aberrant *Ischnura.*

The fragmentary specimen from Piedra Blanca shows an interesting abnormality in the stigmata of the hind wings: the stigmata are triangular, due to the meeting of the proximal with the distal edge at the costa and the entire suppression of the costal edge; the stigmata thus touch the costa at hardly more than a point and only a slight recession from the wing margin would be necessary to produce a condition essentially like that of the stigma of the front wing of *Anomalagrion hastatum* ♂.

109. **Ischnura fluviatilis** Selys.

Ischnura fluviatilis Ris, Hamburg, Magal. Sammelr. Odon., p. 14, 1904; Deut. Ent. Zeitschr. 1908, p. 518.

Habitat: — BRAZIL, Marajo Island, Aug.–Oct., 1907, by Miss H. B. Merrill, 1 ♂, 2 het. ♀; and Rio Grande do Sul, by H. v. Ihering, 2 ♀ no. 333. Academy of Natural Sciences, Philadelphia.

Cachoeira Cuyabá, flooded campo, January 26, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, November, 1899, 1 ♂ (no. 18), 1 ♀ (no. 4), February, 1900, 1 het. ♀. U. S. National Museum.

Villeta, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

Argentina, Santa Helena, east side of Rio Paraná, December 21, 2 ♂, by the same. (Same museum.)

Chile, Baños de Cauquenes (1 ♂, 1 ♀, U. S. N. M.), Penco (1 ♂) and Concepcione (1 ♀), January, 1905 (Acad. Nat. Sci. Phila.), by C. E. Reed.

109*a*. **Ischnura fluviatilis** var. **bizonata** Selys.

Habitat: — Brazil, Uacaryzal, 1 orange ♀; Rio de Janeiro, 2 ♂ and parts of 2 others, 2 orange ♀ and part of 1 other; Rio Grande do Sul, salt marshes, December, 2 ♂, 2 broken ♂, 1 orange ♀; all by H. H. Smith. Carnegie Museum, Pittsburgh.

110. **Anomalagrion hastatum** Say.

Anomalagrion hastatum, Calvert, Biol. Centr.-Amer. Neurop., pp. 130, 390. 1903, 1907.

Habitat: — Bahamas, New Providence, Nassau, June 28, 1904, by Allen, Barbour and Bryant, 1 black ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

Porto Rico, Mayaguez, by O. W. Barrett, January, 1905, 2 ♂, 2 black ♀, 2 orange ♀. Collection of P. P. Calvert.

111. **Ceratura capreola** Hagen.

Ceratura capreola Calvert, Biol. Centr.-Amer. Neurop., pp. 131, 390. 1903, 1907.

Habitat: — Dutch Guiana, Paramaribo, by Miss K. Mayo, 1 citron ♀.

Brazil, Marajo Is., August–October, 1907, by Miss H. B. Merrill, 1 citron ♀.

Saõ Paulo, September 14, 1900, by A. Hempel, 1 black ♀, 1 orange ♀, 1 citron ♀.

All the preceding in the Academy of Natnral Sciences of Philadelphia.

Santa Anna do Japara, August, 1898, by Moenkhaus, 1 citron ♀. Collection of C. C. Adams.

Bom Fim, November 2, 1907, 5 ♂, 1 black ♀, 2 citron ♀, and Barreiras, January 4, 1908, 1 , both in Bahia State; Munez Freire, in Espiritu Santo, June 19, 1908, 1 bl. ♀; Ururahy, June 30, 1908, 1 bl. ♀; all by J. D. Haseman. Carnegie Museum, Pittsburgh.

Rio de Janeiro, November, 4 ♂, 2 ♀; Chapada, 3 ♂ (no. 139); Cuyabá, 2 ♂; Cachoeira, flooded campo, January 26, 2 ♂ (no. 18), 1 citron ♀ (no. 7); Cachoeira, 1 orange ♀ (no. 37); all by H. H. Smith. Carnegie Museum, Pittsburgh.

112. **Palæmnema clementia** Selys.

Habitat: — COLOMBIA, Bonda, in Dept. Magdalena, July, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

113. **Peristicta æneoviridis** sp. nov.

(PLATE VI, FIG. 124.)

♂. Head black; labium, a narrow stripe bordering the eyes inferiorly, extreme anterior margin of labrum and rhinarium yellowish; genæ inferiorly pale blue.

Prothorax and thorax *metallic-green*, inferior parts of mesepimeron and of metapleuron and pectus yellow, a very narrow black stripe on the mid-dorsal thoracic carina; hind lobe of prothorax low, its posterior margin convex.

Abdomen dark metallic-green, becoming black on the posterior segments; very small yellowish spot on each side of the base of 4–6. Hind margin of 10 very slightly emarginated mid-dorsally, *not elevated*. Superior appendages moderately forcipated, twice as thick in the proximal as in the distal half, bearing at mid-length a stout triangular infero-internal tooth not as long as half of the appendage; in profile view the appendages are straight, directed upward, tapering (except for the tooth which is less visible than in dorsal view) from base to apex. Inferior appendages rudimentary.

Legs black; coxæ, trochanters, extreme bases of femora, and upper surfaces of tibiæ yellow; tarsi pale brown. Hairs or spines shorter than the intervals separating them, third femur with 4 (longer) on the outer row, seven (shorter) on the inner row; third tibia with 6 (longer) on the outer, 12 (shorter) on the inner row.

Wings slightly smoky toward the apex; stigma surmounting less than one cell, its distal edge more oblique than the proximal on the front wings. Front wings with 11–12 postnodals; Cu_1 (= superior sector of the triangle of de Selys) terminating *$1\frac{1}{2}$ to 2 cells* distal to the vein descending from the nodus; M_2 (= nodal sector) arising at the fourth postnodal; M_{1a} (= ultra-nodal sector) at the sixth or seventh.

Hind wings with 9–10 postnodals, M_2 arising at the third, M_{1a} at the sixth, Cu_1 ending *2½ cells* distal to the vein descending from the nodus.

Abdomen 27, hind wing 16 mm.

♀ unknown.

Habitat: — PARAGUAY, Sapucay, by W. T. Foster, November, 1899, 1 ♂. United States National Museum.

Differs from the description of the only other known species of the genus, *P. forceps* Hagen, of "Brazil," by the italicised characters.

The sides of the prothorax and of the thorax inferiorly, the coxæ, base of the abdomen, and the superior appendages are slightly pruinose in this male.

114. **Neoneura bilinearis** Selys.

Habitat: — BRAZIL, Muniz Freire in Esperitu Santo, June 18, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

115. **Neoneura fulvicollis** Selys.

Habitat: — BRAZIL, Uacaryzal, 1 ♂, and Rio Cuyabá, January 23, 1886, part of 1 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

116. **Neoneura rubriventris** Selys.

Habitat: — BRAZIL, Rio Grande do Sul, by H. v. Ihering, 2 ♂, no. 331. Academy of Natural Sciences, Philadelphia.

117. **Neoneura sylvatica** Selys.

Habitat: — BRAZIL, Rio Salitre, State of Bahia, November 13, 1907, by J. D. Haseman, 1 ♂. Chapada, 1 ♂, no. 184, and Cachœira, part of 1 ♂ no. 28, by H. H. Smith. Carnegie Museum, Pittsburgh.

118. **Protoneura capilliformis** Selys.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♂, 1 ♀, nos. 36, 37, 78. Carnegie Museum, Pittsburgh.

119. **Protoneura capillaris** Rambur.

Habitat: — JAMAICA, Kingston, by W. J. Fox, 1 ♂. Academy of Natural Sciences, Philadelphia.

120. **Protoneura tenuissima** Selys.

Habitat: — BRAZIL, Peixe-Boi, November–December, 1907, by Miss H. B. Merrill, 1 ♀. Academy of Natural Sciences, Philadelphia.

Gomphinæ.

121. **Progomphus complicatus** Selys.

Habitat: — Paraguay, Sapucay, by W. T. Foster, November, 1899, 1 ♂, December, 1899, 4 ♂ no. 41. U. S. National Museum.

Length of abdomen 33–35.5, hind wing 24–26.5 mm.

122. **Progomphus intricatus** Selys.

(Plate VII, fig. 129.)

Habitat: — Brazil, Chapada, by H. H. Smith, 9 ♂ and parts of 4 others, 4 ♂ and part of one other, nos. 137 and 44, 1 ♂ is dated May. Carnegie Museum, Pittsburgh.

See also under the following species:

123. **Progomphus recticarinatus** sp. nov.

(Plate VII, fig. 128.)

Closely related to *P. intricatus;* the differences may be seen from the following comparison.

	P. intricatus.	*P. recticarinatus.*
Occiput:	wider;	narrower.
Superior frontal band:	pale brown;	blackish.
Hind lobe of prothorax:	blackish, rarely yellowish in the middle (♂); yellow margined with black (♂ and 1 ♀);	yellow.
Darker color of thorax:	pale brown;	blackish-brown.
Pale (yellow) ante-humeral stripe:	confluent below with the yellow mesothoracic "collar," almost touching the ante-alar sinus above;	not confluent with the yellow "collar," not reaching the antealar sinus above.
Yellow "humeral" line (really ante-humeral):	complete;	interrupted near its upper end, which is represented by a spot.
Lateral abdominal markings on 3–7:	brown, not well developed anterior to the median transverse suture of each segment, much paler and and less extended in the ♀;	blackish-brown, well developed anterior to the median suture.

Dorsum of abd. segs. 8 and 9:	dark-brown not narrowed, or narrowed posteriorly on each ;	dark brown, narrowed posteriorly on each, or not narrowed on 8.
Abdominal segment 10 :	reddish-yellow, only slightly brown at extreme base, or (in 1 ♂) with two brown dorsal stripes for its entire length ;	with a middorsal blackish band from end to end.
Superior appendages in dorsal view :	tapering more gradually to apex, yellowish, no black at base ;	tapering less gradually, greenish, blackish at base.
Do., in profile view :	the external basal denticulated carina distinctly sinuate ;	the same carina almost straight
Branches of the inferior appendage :	yellowish, more strongly curved mesad at tips;	blackish, less strongly curved at tips.
Apices of the 11th segment (anal tubercle) in dorsal view :	blackish, more acute ;	greenish, less acute.
Abdominal segment 10 (♀), dorsum :	obscure brownish, not quite so dark as those of 8 and 9, almost equal in length to 9 ;	black, half as long as 9.
Appendages ♀ :	longer than 10, subequal to 9, yellowish, tapering to a very acute apex ;	longer than 10, shorter than 9, greenish-yellow, not tapering much except at apex.
Vulvar lamina ♀ :	about one-sixth as long as 9, bilobed almost to base, each lobe wider than long, its apical margin concave, thus forming two angles, of which the ventral-inner one is obtuse and free, while the outer-dorsal one is applied against the ventral surface of 9 ;	about one-fourth as long as 9 but shaped as in *intricatus*.
Discoidal triangle, front wing :		
3-celled in	19 wings ♂, 9 wings ♀ ;	8 wings ♂.
2-celled in	7 " ♂, 1 wing ♀ ;	2 " ♂.
Internal triangle, front wing :	2 celled in all examples ;	2-celled in all examples.
Discoidal triangle, front wing :		
2-celled in	19 wings ♂, 6 wings ♀ ;	9 wings ♂.
3-celled in	7 " ♂, 4 " ♀ ;	1 wing ♂.

Internal triangle hind wing:		
2-celled in	16 wings ♂, 7 wings ♀;	10 wings ♂.
free in	10 " ♂, 2 " ♀;	
Length of abdomen in mm.:	31–33 ♂; 29–31 ♀;	31.5–33 ♂.
" " hind wing in mm.:	23–25 ♂; 24–25.5 ♀;	25–26.5 ♂.
Distance on front wing from nodus to stigma in mm.:	6–7.	7–8.

Both species lack a sternal process on abdominal segment 1; both have the pale antehumeral stripes diverging from each other both on their inner and their outer edges.

Hab. (*of recticarinatus*): BRAZIL, Chapada, by H. H. Smith, 4 ♂ and part of one other, 1 ♀ abdomen attached to a thorax and head of a *P. intricatus* ♀; one numbered 69, some dated May and December. Carnegie Museum, Pittsburgh.

P. recticarinatus differs from *P. complicatus* by its smaller size, absence of blackish-brown on the face, predominance of yellow on 3–7 in dorsal view, shorter and more strongly curved branches of the inferior appendage ♂; it differs from *P. jorgensi* Ris by the absence of black spots at the base and nodus of the wings, and its smaller size.

124. **Gomphoides hesperus**, sp. nov.

(PATE VII, FIGS. 125, 125*s*.)

♂. Head brown (partly discolored?); external surface of the mandibles greenish-yellow; superior surface of frons moderately declined; hind margin of the occiput straight, with blackish hairs.

Thoracic dorsum blackish-brown, a green antehumeral stripe not attaining the antealar sinus, widening forward (cephalad) especially in the foremost third, so that at the anterior mesepisternal margin the stripe is more than twice as wide as at mid-height; this widening is on the outer (lateral) edge of each stripe, as the inner (mesial) edge is parallel to the mid-dorsal carina and is as far therefrom as the stripe is wide at mid-height; a second, narrower, green antehumeral stripe is placed just anterior to the humeral suture by less than its own width, it also does not quite reach the antealar sinus. Sides of the thorax chiefly green, a brown stripe on the whole length of the first and of the second lateral sutures; pectus greenish.

Abdominal segments 1 and 2 chiefly greenish-yellow, with a brown stripe on each side (above the greenish-yellow auricles on 2); 3–10 chiefly blackish-brown, with the following yellow or orange markings: a mid-dorsal line or very narrow stripe on 3–6 and 8–9, but on 7 occupying the whole width of the segment for its anterior two-fifths, narrowing posteriorly on the remaining three-fifths, this mid-dorsal line or stripe almost as long as each segment; a basal spot on each side of 3–6 occupying a third of the segment or less, the sides inferiorly of 7–10, sternites of 8–10. Inferior lateral margins of 8 and 9 enlarged, that of 8 being sinuate in profile view, slightly convex for the first half, then still more slightly concave, becoming more strongly convex and denticulated in the hindmost fourth; that of 9 obtusely angulate (about 150°) at one-third length, remaining two-thirds very slightly concave. 10 in dorsal view constricted in the middle, its posterior margin wider than its anterior and very slightly and widely concave medially.

Superior appendages subequal in length to 10, blackish; in dorsal view nearly straight in the proximal three-fifths, strongly curved toward each other in the remaining two-fifths, each decreasing gradually in width to half its length; apex somewhat obtuse, preceded on the inner side by a distinct parallel finger-like tooth, which falls short of reaching the level of the apex by more than its own length, no other tooth or tubercle on the inner surface of the appendage; in profile view each superior appendage decreases in thickness from base to apex; terminal fourth curved downward; apex moderately acute; an obtusely pointed superior tooth on the upper surface immediately after the base, and a longer, flatter, rounded tubercle on the inferior surface, likewise immediately after the base.

Inferior appendage extremely short, not projecting caudad beyond the level of the posterior dorsal margin of 10.

Coxæ and femora greenish or greenish-yellow; tibiæ and tarsi brownish.

Wings slightly clouded with pale brownish-yellow, especially in the distal three-fifths; stigma ochre; veins, including the costa, brown or black; internal triangle of the hind wings free; the other three triangles two-celled. Front wings with 17–18 antenodals, 10–12 postnodals; and at most two rows of cells in Cu_2 area (= area be ween the inferior sector of the triangle of Selys and the hind margin). Hind wings with at most three rows of cells in the same area.

Abdomen 39.5, hind wing 30; costal edge of stigma of front wing 3.5 mm.

♀ unknown.

Habitat: — ECUADOR, Quevedo, by Prof. F. Campos R., 1 ♂, no. 140 of the collector. Academy of Natural Sciences of Philadelphia.

This species is a *Cyclophylla* of Selys. It falls next to *Gomphoides volsella* Calvert, in the Synopsis of Mexican and Central American species in Biol. Centr. Amer. Neuropt., p. 154. It differs from *volsella* in the shape of the appendages; and in the anterior green antehumeral stripe being narrower, not reaching to the antealar sinus nor confluent with the second or posterior green antehumeral stripe superiorly (as is the case in *volsella*).

125. **Gomphoides viridipleuris** sp. nov.

(PLATE VII, FIGS. 126, 126*s*.)

♂. Head bluish-green; basal parts of labium, extreme free edges of labrum and of nasus, and external surfaces of mandibles yellow; ocellar area brown; superior surface of frons nearly horizontal, not declined; hind margin of occiput nearly straight, with black hairs.

Prothorax green; hind lobe and some marks on the middle lobe blackish-brown.

Thoracic dorsum rich chocolate-brown, the following yellow: an antehumeral stripe of almost uniform width (.8 mm.) about as far from the mid-dorsal carina as its own width and almost parallel thereto, being only a little nearer to the carina at its upper than its lower end, confluent below with a transverse yellow stripe ("collier mésothoracique"), which latter is interrupted at the lower end of the median carina; a fine green line on all but the upper end of the humeral suture; a slightly wider green line a short distance in front of, and parallel to, the humeral suture for the whole height of the sclerite.

Anterior edge of the mesepimeron with a brown line or narrow stripe about equal in width to the brown, which separates the just-mentioned humeral and antehumeral lines, but *all the remainder of the mesepimeron and all the metapleuron yellowish-green, without darker markings of any kind.* Pectus yellowish.

Abdominal segments 2–7 greenish-yellow mid-dorsally for the entire length of each segment, except at the intersegmental articulations, but narrowing posteriorly on each (in some to a mere line); sides superiorly blackish-brown behind the greenish auricles on 2, for the whole length of 3, and for nearly the whole length of 4–7, excepting for the basal tenth of each; this brown widens posteriorly on each segment reaching up on the dorsum, but is not confluent with the brown of the opposite side, except at the intersegmental articulations. 8–10 similarly marked, but the mid-dorsal yellow is narrower, and may not reach to the hind end of each. Sides of all the abdominal segments inferiorly and the sternites of 8–10 yellow; sternites of 3–7 blackish. Inferior lateral margins of 8 and 9 enlarged; that of 8 convex, especially near the posterior end, and denticulated; that of 9 hardly convex, almost straight, not denticulated. Hind margin of 10 convex and entire medially, its inferior lateral angle on each side with a tuft of brownish-yellow hairs and folded under and applied against the sternite. In dorsal view 10 is constricted at mid-length, its hind end wider than its front end.

Superior appendages longer than 10, subequal to 9, brownish at base, blackish at apex, yellowish within. In dorsal view each appendage is almost straight for its proximal two-thirds, but decreases gradually in width, especially on the inner side; distal third strongly curved inward (mesad); apex rounded, and preceded on its inner side by a distinct finger-like process, which falls short of reaching the level of the apex by more than its own length; at about half length the inner surface bears a small blunt tubercle nearer the upper edge of the appendage. In profile view each superior appendage is nearly straight in its proximal two-thirds, curved rather strongly down in its distal third; apex moderately acute; in the proximal fourth the appendage decreases greatly in thickness, especially on its upper surface, while the lower surface bears a well-marked rounded tubercle.

Inferior appendage very short, not reaching to more than the level of one-tenth of the superiors.

Legs greenish-yellow; a supero-external femoral stripe; most of the tibiæ (except their proximal superior portions) and the tarsi black.

Wings slightly clouded with obscure yellowish; stigma pale ochre; costa yellow anteriorly; other larger veins brownish; internal triangle of hind wing free; the other three triangles two-celled (3-celled in the discoidal triangle of one front wing); front wings with 16–19 antenodals, 9–12 postnodals; at most three rows of cells between Cu_2 (= inferior sector of the triangle of de Selys) and the hind margin. Hind wings with 4–5 rows in the same area.

Abdomen 37–38; hind wing 28–29 mm.

♀ unknown.

Habitat: — PARAGUAY, Sapucay, December, 1899, W. T. Foster, 3 ♂. United States National Museum.

This species would be referred to *Cyclophylla* in the Selysian classification; it differs from the previously described species in its combination of immaculate green sides of the thorax with superior appendages of the shape here given. It falls under rubric B of the synopsis of Mexican and Central American species of *Gomphoides* in Biol. Centr.-Amer. Neurop., p. 153.

126. **Gomphoides dentata** Selys.

Aphylla dentata Ris, Hamburg. Magal. Sammelr. Odon., p. 16. 1904.

PARAGUAY, Rio Paraguay below Asuncion, Dec. 24, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

Rio Paraguay below Concepcion, Dec. 30, by H. H. Smith, part of 1 ♂. Carnegie Museum, Pittsburgh.

These specimens measure: abdomen 45, hind wing 34–35 mm.

The published descriptions do not mention that the hind dorsal margin of abd. seg. 10 has a small median semicircular notch, the diameter of which is about one-half of that of either superior appendage at base.

The male of December 30 has the green antehumeral stripes confluent below for the inner (mesial) half of the width of each, with the green "collier mésothoracique."

127. **Gomphoides camposi** sp. nov.

(PLATE VII, FIG. 127.)

♂. Head brown; frons superiorly, mandibles externally, labium, some indistinct marks on the rear of the head, and occiput green. Superior surface of frons, viewed from in front, concave medially for a depth equal to the diameter of the median ocellus. Hind margin of the occiput slightly convex, with long black hairs.

Prothorax brown; thoracic dorsum darker brown; a greenish-yellow antehumeral stripe (about 8 mm. wide at mid-height) widening anteriorly, where it is confluent with a transverse anterior mesothoracic stripe, ("collier mésothoracique"), this latter interrupted at the lower end of the mid-dorsal carina; the antehumeral stripe not quite reaching the antealar sinus above, diverging slightly from above downward (forward) from the mid-dorsal carina, from which it is distant by about its own width. No second pale antehumeral or pale humeral stripe. A pale green stripe about mid-way between the humeral and obsolete first lateral sutures, narrower than the brown areas, which precede or follow it. A green stripe, narrowing upward and interrupted before it reaches the superior metapleural margin, just in front of the second lateral suture. The larger (posterior) part of the metepimeron and all of the pectus greenish-yellow.

Abdominal segment 1 greenish-yellow, dorsum brownish; 2 greenish-yellow below, and, including the auricles, brown above, with a narrow median yellow stripe ; 3-10 blackish ; the following yellow : basal fourth and a confluent mid-dorsal stripe, narrowing posteriorly and reaching to the posterior transverse row of denticles of 3 ; basal eighth of 4–6 ; basal two-fifths of 7 ; an indistinct basal mid-dorsal spot on 8 ; inter-articular membrane between 9 and 10. Inferior lateral margins of 8 and 9 enlarged, that of 9 strongly convex, the maximum of the enlargement at five-sixth of the segment's length and equal to half of the height of the segment at base ; that of 9 regularly convex and most enlarged at mid-length of the segment. Segment 10 in dorsal view slightly constricted in the middle, its entire and almost straight posterior margin a little wider than its anterior ; in profile view its hind end longer (higher) than its front end, its lower surface three-fifths as long as its dorsal surface.

Superior appendages 2.5 mm. long, more than twice as long as 10, longer than 9, subequal to 8, blackish at base, yellow at apex, curved toward each other in the distal third, decreasing in width and thickness from base to apex, armed with teeth and spines as follows : a small acute inferior tooth at one-sixth length, a long strong acute inferior spine directed downward, caudad, and inward at two-fifths length, a stout rather obtuse superior tooth or tubercle directed upward and inward at two-thirds length ; the extreme acute apex is bent upward almost at right angles, the angle coinciding with the end of an inner thickening of the appendage homologous to the finger-like process of other species.

Inferior appendage black, divided shortly beyond its base into two slender branches, which are as distant from each other as are the two superior appendages at their bases, each branch curved upward and slightly outward, and reaching caudad as far as the level of the base of the stout inferior spine of the superiors.

Coxæ and femora greenish, tibiæ and tarsi black.

Wings yellow at the extreme base not as far as to the basal subcostal cross-vein; stigma blackish-brown; costa yellow anteriorly, other veins black or brown; internal triangle of hind wings free, the other three triangles 2-celled. Front wings with 20–22 antenodals, 13–14 postnodals; at most three rows of cells between Cu_2 and the hind margin. Hind wings with at most four rows of cells in the same area.

Abdomen 43, hind wing 32, costal edge of stigma of front wing 3.7 mm.

♀ unknown.

Habitat: — ECUADOR, Quevedo, by Prof. F. Campos R., 1 ♂, numbered 86 by the collector. Academy of Natural Sciences of Philadelphia.

This species, named in honor of the savant who has communicated the type specimen, and who has undertaken the preparation of a Catalogue of Ecuadorian Odonata, is perhaps related more nearly to *G. ? annectens* Selys than to any other known species. *Annectens* is a larger species, with 3-celled discoidal triangles on all the wings, a longer pterostigma, and differently shaped superior appendages, the latter having a strong triangular tooth, apparently replacing the stout inferior spine of *camposi*, and the details at the apex are different.

G. camposi will fall under rubric F with *G. suasa* in the synopsis of Mexican and Central American species in Biol. Centr.-Amer. Neuropt., p. 154.

128. **Neogomphus molestus** Selys.

Habitat: —CHILE, Baños de Cauquenes, by E. C. Reed, 1 ♂. United States National Museum.

ÆSHNINÆ.[31]

129. **Anax longipes** Hagen.

Anax longipes Calv., Biol. Centr.-Amer. Neurop., p. 176.

Habitat: — BAHAMAS, Eleuthera Is., April 11–21, 1897, by C. J. Maynard, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

130. **Æshna bonariensis** Rambur.

Æshna bonariensis Ris, Hamburg. Magal. Sammelr. Odon., pp. 24, 25. 1904; Deut. Ent. Zeitschr., 1908, pp. 523, 525.

Habitat: — BRAZIL, Sete Lagoas, in Minas Geraes, May 3, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

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[31] In view of the appearance of the first installment of M. Rene Martin's "Æschnines," of the Selys Catalogue, I have included here only the Æshninæ of the Carnegie Museum, reserving all others for future study.

131. **Æshna haarupi** ? Ris.

Æshna haarupi Ris, Deut. Ent. Zeitschr., 1908, p. 523.

Habitat: — BRAZIL, Rio de Janeiro, November, by H. H. Smith, 1 ♀. Carnegie Museum, Pittsburgh.

Agrees fairly well with Dr. Ris' description, but has the T-spot of the frons like that of *Æ. confusa* Ramb.; hind wing 43 mm., appendages lost.

132. **Æshna ingens** Rambur.

Æshna ingens Calvert, Biol. Centr.-Amer. Neurop. p. 187. 1905.

Habitat: — BAHAMAS, Berry Is., April 7, 1891, 1 ♂, and Great Harbor Cay, April 3, 1891, 1 ♂, by C. B. Cory. Museum of Comparative Zoölogy, Cambridge, Mass.

133. **Æshna adnexa** Hagen.

Æshna adnexa Calvert, Biol. Centr.-Amer. Neurop., p. 188. 1905.

Habitat: — COLOMBIA, Bonda, by H. H. Smith, 1 ♀. Carnegie Museum.

134. **Gynacantha septima** Selys.

Gynacantha septima Calvert, Biol. Centr.-Amer. Neurop., p. 191. 1905.

Habitat: — COLOMBIA, Bonda, by H. H. Smith, 2 ♂, 1 ♀. Carnegie Museum.

135. **Gynacantha nervosa** Rambur.

Gynacantha nervosa Calvert, Biol. Centr.-Amer. Neurop., p. 193. 1905.

Habitat: — COLOMBIA, Bonda, 2 ♀, and Don Diego, 1 ♂, by H. H. Smith. Carnegie Museum.

CORDULINÆ.

136. **Gomphomacromia paradoxa** Brauer.

Gomphomacromia paradoxa Needham, Proc. U. S. Nat. Mus. xxvi, pl. 43, fig. 1, p. 722, fig. 17[4]. 1903. Ris, Hamburg. Magal. Sammelr. Odon. p. 30. 1904. Martin, Selys Coll. Cordulin., p. 56, figs. 60, 73, pl. II, fig. 9. 1906.

Habitat: — CHILE, Banos de Cauquenes, by E. C. Reed, 1 ♂, 1 ♀. PATAGONIA, Latitude Cove, 1 ♀, from the U. S. Fish Commission. All three specimens in the U. S. National Museum.

137. **Neocordulia volxemi.**

(PLATE VII, FIGS. 132, 133).

Gomphomacromia volxemi Selys, Bull. Acad. Belg. (2) xxxvii, p. 21. 1874.
Martin, Coll. Zoöl. Selys Cordulin. p. 55, fig. 72 (venation). 1906.
Neocordulia volxemi Selys, Compt. Rend. Soc. Ent. Belg. 1882, p. clxix.
Kirby, Cat. Odon. p. 53. 1890.

This species has hitherto been known only from the female sex. M. Martin has again referred it to *Gomphomacromia* after de Selys had removed it to the more lately established *Neocordulia*. M. Martin remarks, *l. c.*, "Cette espèce forme le passage entre les *Neocordulia* et les *Gomphomacromia*: si on tient compte de l'écaille vulvaire courte, elle devrait être classée avec les *Neocordulia;* si, au contraire, on remarque qu'elle n'a, après un rang de 2 ou 3 cellules d'abord, qu'un seul rang de postrigonales, sa place est avec les *Gomphomacromia.*" Yet the figure accompanying M. Martin's text, fig. 72, shows two rows of posttriangular cells from triangle almost to the hind margin of the front wings and for five cells beyond the triangle on the hind wings, when the number of rows increases — in no place a single row. De Selys also gives no hint that *volxemi* has other than "deux rangs postrigonaux" (*l. c.* 1882). There seems to be no reason, therefore, so far as the posttriangular rows are concerned, for excluding *volxemi* from *Neocordulia.*[32]

♀. Two females from Chapada in the Museum of Comparative Zoölogy agree quite well with de Selys' description and M. Martin's figure, except that the abdominal appendages are longer than 10, more than half as long as 9. The vulvar lamina, the length of which is not given by the preceding authors, reaches to the level of one-third the length of the sternite of 9, which latter bears two small style-like processes at the level of the tip of the vulvar lamina.

♂. Two males in the same Museum, one labeled Chapada, December, the other simply "Brazil," are very probably of this species. They have the face and lips greenish-yellow, becoming brownish, with some metallic-blue reflection on the anterior surface of the frons and on the vertex. Occiput dull pale brown or yellow.

Thorax brilliant metallic-green, the sutures and most of the ventral surface pale brown.

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[32] An error which has crept into Prof. Needham's work "A Genealogic Study of Dragon-fly Wing Venation" (Proc. U. S. Nat. Mus. xxvi, pp. 703–764. 1903) may also be corrected here. Fig. 1, pl. xlii, given as the wings of *Neocordulia androgynis*, is not that of a *Neocordulia* at all, but of something close to *Dorocordulia*.

Abdomen dark brown with the following pale brown or yellow markings: a spot on each side near the hind end of 2; a narrow transverse stripe on the median suture of 3–6, between which and the anterior end of each of these segments the mid-dorsal surface is indefinitely paler; a triangular mid-dorsal spot on 7–9, reaching from the anterior end to more than half of the length of each segment; a spot on each side of 10.

Abdomen somewhat compressed in 1–2, narrower and more slender in 3–6, widened from the anterior end of 7 to the hind end of 8, thence narrowing. Ventral surface of 8 just anterior to mid-length with a stout process, *not half as long as 8*, which is bifid at tip; apices acute.

Superior appendages twice as long as 10, a little longer than 9, yellowish at base, brown at apex, in dorsal view *almost straight*, their inner margins diverging, their outer margins *almost parallel or diverging moderately*, inner-upper surface of each at two-fifths' length *with a moderate and rather obtuse tooth*, outer surface at three-fourths' length *with a smaller tubercle*, inferior surface at one-fifth length with a still smaller but acute tooth, apex of the appendage blunt, distal half with many long hairs, chiefly on the inner side.

Inferior appendage yellowish, reaching to the level of three-fourths of the length of the superiors; in ventral view with a truncated apex, half as wide as the base, and terminating in two upturned denticles.

Genital hamule yellow, almost as prominent as the genital lobe, bifid at apex, branches transverse, outer branch longer, strongly hooked, directed mesad. Genital lobe yellow, rather densely covered, chiefly on its mesial side, with dark hairs.

Wings slightly smoky or dirty yellowish.

Abdomen 38–40, hind wing 35; costal edge of stigma of front wing 2.5 mm.

These males much resemble those of *N. androgynis* Selys, but differ therefrom in the appendages, the differences from de Selys' description and M. Martin's figure 69 (of the appendages of *androgynis*) being indicated in the above description by italics.

The female of *N. volxemi* appears to differ from that of *N. androgynis* chiefly by its larger size (abdomen 38–39 *vs.* 37, hind wing 38 *vs.* 34 mm.)

138. **Dorocordulia errans** sp. nov.

(PLATE VII, FIG. 131.)

♂. Head lost (replaced by that of some Libelluline).

Thorax metallic-green with some pale brown on the sutures and on the pectus.

Abdomen in dorsal view narrowing very gradually from 2 (2.2 mm.) to the base of 5 (1.2 mm.), thence widening to the base of 8 (3 mm.), thence narrowing to the hind end of 10 (1.2 mm.); segment 1 pale brown, dorsum of 2–8 metallic-green, bordered on each side with orange for the entire length of each segment above the lateral carina; 9 similar, except that black replaces the metallic-green, 10 black, with a small orange spot on each side at its hind end, and a low mid-dorsal carina. Ventral side of 3–10 blackish, the extreme inferior edges of the tergites, where they underlap the sternites, yellowish.

Superior appendages not quite as long as 9 + 10, dark brown, subcylindrical, slightly enlarged in the proximal fourth and in the distal third chiefly on the outer and lower surfaces, *apex rounded, not at all acute*, lower surface bordered externally with a carina, which at the extreme base forms a slight convexity, *no other teeth or tubercles*.

Inferior appendage almost as long as the superiors, blackish, triangular when viewed from below, much attenuated in the distal third; apex one-fourth as wide as base, barely excised, slightly upcurved.

Wings very faintly yellowish, this color best seen in the anal triangle; stigma brown (its costal edge 2 mm. long), many of the veins in the proximal half of the wing pale brown or yellow, darker in the distal half and near the hind margin. Venation very similar to that shown in Plate XLII, fig. 1,[33] Proc. U. S. Nat. Mus., vol. xxvi, by Prof. Needham, even to the anal loop, but differing in that the front wings have the internal triangle divided into two cells by a perpendicular vein and two rows of posttriangular cells not interrupted by three cells just proximal to the level of the nodus. The agreement with this figure is indeed better than with that of *D. libera* given by M. Martin (Coll. Zoöl. Selys, Cordulin. p. 35, fig. 39). We may add that the front wings have 7–8 antenodals, 6 postnodals; the hind wings 5 antenodals, 7–8 postnodals.

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[33] This is the figure, erroneously labeled as *Neocardulia androgynis* in the explanation of that plate, to which attention is called in the footnote to page 223 of the present memoir.

Abdomen 30, hind wing 29 mm.

♀ unknown.

Habitat: — BRAZIL, Chapada, presumably by H. H. Smith, 1 ♂ numbered 8. Museum of Comparative Zoölogy, Cambridge, Mass. This specimen was once examined by Prof. Needham, as it bears a label in his handwriting "Near *Somatochlora libera* Selys," an opinion with which I thoroughly agree. It differs from *libera* and also *lepida* Selys in the shape of the superior appendages, as indicated by the italicized portions of the above description.

It is surprising, however, to find what appears to be a *Dorocordulia* in southern Brazil, as the genus has not hitherto been known south of Maryland. There is, therefore, ground for suspecting that the locality-label may have been misplaced, but in any event the species appears to be undescribed previously.

139. **Somatochlora villosa** Rambur.

Somatochlora villosa Ris, Hamburg. Magal. Sammelr. Odon., p. 29. 1904. Martin, Coll. Selys, Cordulin., p. 20, fig. 15. 1906.

Habitat: — CHILE, Baños de Cauquenes, 1 ♂; Valparaiso, 1 ♀; E. C. Reed. U. S. National Museum.

LIBELLULINÆ.

140. **Libellula herculea** Karsch.

Libellula herculea Calvert, Biol. Centr.-Amer. Neurop. p. 209, 1905.

Habitat: — COLOMBIA, Don Amo and Minca, by H. H. Smith, each 1 ♂ in July. Carnegie Museum, Pittsburgh.

VENEZUELA, San Julian, July 20, 1900, by M. W. Lyon, Jr., 1 ♂, 1 ♀. U. S. National Museum.

PARAGUAY, Sapucay, by W. T. Foster, December, 1899, to March, 1900, 4 ♂, 1 ♀. U. S. National Museum.

Some comparative data for the Sapucay males are given in the 'Biologia' volume quoted above.

141. **Zenithoptera americana** Linnæus.

Habitat: — BRAZIL, Galhaõ, February 7, 1908, part of 1 ♀; Rio Sapon, January 30, 1908, 1 ♀; by J. D. Haseman.

Ucaryzal, February, by H. H. Smith, part of 1 ♂.

Carnegie Museum, Pittsburgh.

142. **Ephidatia longipes** Hagen.

Ephidatia longipes Calvert, Biol. Centr.-Amer. Neurop. p. 216. 1906.

Habitat: — BRAZIL, Sete Lagoas in Minas Geraes, May 4, 1908, by J. D. Haseman, 1 ♀. Carnegie Museum, Pittsburgh.

143. **Ephidatia longipes cubensis** Calvert.

Ephidatia longipes cubensis Calvert, *l. c.*, p. 216. 1906.

Habitat: — BAHAMAS, New Providence Is., vicinity of Nassau, June 28–July 1, 1904, by Allen, Barbour, and Bryant, 1 ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

Genus URACIS Rambur.

Calvert, Biol. Centr.-Amer. Neurop. pp. 199, 217. 1905, 1906.

The species of this genus known to me may be distinguished as follows:

A. Hind wing with the discoidal triangle free, four cubito-anal cross-veins, one posttriangular row increasing to two at, or a little distal to, the level of separation of M_{1+2} (= principal sector of de Selys) from M_3 (= median sector); front wing with two cubito-anal cross-veins, three posttriangular cells followed by two rows increasing to three rows between the levels of separation of M_{1+2} from the bridge and of the nodus; no supra-triangular cross-veins on any wing.

B. Hind wing with two rows of cells between A_3 and the hind margin at the level of the hind angle of the triangle; wings uncolored; size smaller: abd. ♂ 23, hind wing ♂ 27, ♀?..*siemensii.*

BB. Hind wings with three rows of cells between A_3 and the hind margin at the level of the hind angle of the triangle; wings (of the ♀ at least) brown at tips into the level of the distal end of stigma or nearly so, ovipositor extremely long (3.7 mm. from the hind ventral margin of 8), projecting 3 mm. beyond the hind end of the abdomen; size larger: abd. ♀ (excl. ovip.) 23.5–25.5, hind wing ♀ 33–35, ♂? *ovipositrix.*

AA. Hind wing with the discoidal triangle cross-veined.

C. Hind wing with one posttriangular row, two cells between A_3 and the anal margin; front wings with not more than two posttriangular rows to the level of the nodus; a supratriangular cross-vein and 4–6 cubito-anal cross-veins present on all wings.

D. Wings uncolored; abd. ♂ 26, ♀ 24–25; hind wing ♂ 31.5, ♀ 27.5–30 mm..*ovata.*

DD. Wings with a transverse brown band from nodus to proximal end of stigma; abd. ♂ 25, hind wing ♂ 30 mm. ♀ ?...........*infumata.*

CC. Hind wing with two posttriangular rows, 3–4 cells between A_3 and the anal margin; front wings with three posttriangular rows for at least part of the way to the level of the nodus; tips to distal halves of all wings brown.

E. Supratriangular cross-veins absent on the front wings, often also on the hind; front wings with 1–3 cubito-anal cross-veins; vulvar lamina projecting 1 mm. or less beyond the hind end of the abdomen; abdomen ♂ 21–24, ♀ 22–23; hind wing ♂ 25–28, ♀ 25–28.5 mm. *imbuta.*

EE. Supratriangular cross-veins present on all the wings; front wings with 4–6 cubito-anal cross-veins; vulvar lamina projecting 2 mm. beyond the hind end of the abdomen; abdomen ♂ 25–30, ♀ 23.5; hind wing ♂ 31–35, ♀ 29–33 mm.............................. ....*fastigiata.*

144. **Uracis siemensii** Kirby.

Uracis siemensii Kirby, Ann. Mag. Nat. Hist. (6), xix, p. 605, pl. xii, fig. 3. 1897.

Habitat: — BRAZIL, Para Thayer Expedition, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

145. **Uracis ovipositrix** sp. nov.

(PLATE IX, FIG. 145.)

(Description in the preceding synopsis.)

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♀, part of 1 other and of 1 specimen, some numbered 171 by the collector. Carnegie Museum, Pittsburgh.

146. **Uracis ovata** sp. nov.

(Description in the preceding synopsis.)

Habitat: — BRAZIL, 1 ♀ without further locality, Bahia, 1 ♂, 1 ♀; 1 ♀ without locality-label. Museum of Comparative Zoölogy, Cambridge, Mass.

147. **Uracis infumata** Rambur.

Habitat: — BRAZIL, 1 ♂ with no further locality, Bahia 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

148. **Uracis imbuta** Burmeister.

Uracis imbuta Calvert, Biol. Centr.-Amer. Neurop. pp. 218, 402, pl. ix, fig. 6. 1906, 1907.

Habitat: — COLOMBIA, Bonda, October, 1 ♂.

BRAZIL, Para, August, 1 ♂; Chapada, 10 ♂, 6 ♀.

All by H. H. Smith, Carnegie Museum, Pittsburgh.

149. **Uracis fastigiata** Burmeister.

Uracis fastigiata Calvert, Biol. Centr.-Amer. Neurop. pp. 219, 402, pl. ix, figs. 7, 8. 1906, 1907.

Habitat: — COLOMBIA, Don Diego, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

150. **Tholymis citrina** Hagen.

Tholymis citrina Calvert, Biol. Centr.-Amer. Neurop. p. 220, pl. ix, figs. 9–11. 1906.

Habitat: — COLOMBIA, Bonda, by H. H. Smith, 2 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

MICRATHYRIA.

The following, modeled after the less extensive but more detailed synopsis of the Mexican and Central American species, in the Biologia Centrali-Americana, Neuroptera, pages 221–223, shows the gradual reduction (or, if preferred, and the table be read backward, the gradual increase) in density of the venation. It does not pretend to include all of the known South American species, but only those treated in this paper. As was pointed out in the work cited, these venational characters are subject to more, (*e. g.*, *M. didyma hypodidyma*), or less variation, so that specific identifications can not be based on them alone; but reference should always be made to the structure of the genitalia and abdominal appendages of the males, and the vulvar lamina and gonapophyses of segment 9 of the females. On resemblances in these structures have been erected the subspecies of *M. didyma* and of *M. ocellata*, in spite of the venational differences.

Synopsis of Venational Characters of some South American Species.[34]

A. Number of cells between the hind angle of the triangle and vein A_2 immediately opposite that angle on the hind wing *two*.
  A. 1. Internal triangle of the front wing 3-celled.
    B. Discoidal triangle of the front wing 2-celled.
      C. Posttriangular field of the hind wing with no single cell reaching from M_4 (= short sector of de Selys) to Cu_1 (= upper sector of the triangle)...*didyma*, some *didyma hypodidyma*, *dythemoides*.
      CC. Posttriangular field of the hind wing with at least one cell reaching from M_4 to C_1...*atra*.
    BB. Discoidal triangle of the front wing free.

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[34] The letters preceding certain rubrics, as A, B, C, etc., are employed to indicate similar rubrics in the table in the Biologia.

BB. 1. Posttriangular field of the hind wing with no single cell reaching from M_4 to Cu_1......Most *didyma hypodidyma*, *spinifera*.

BB. 2. Posttriangular field of the hind wing with at least one cell reaching from M_4 to Cu_1. ....*ocellata*.

A. 2. Internal triangle of the front wing 2-celled; discoidal triangle of the front wing free.

Posttriangular field of the hind wing with no single cell reaching from M_4 to Cu_1 ....*didyma laevigata*.

Posttriangular field of the hind wing with at least one cell reaching from M_4 to Cu_1 ....*ocellata dentiens*.

A. 3. Internal and discoidal triangles of the front wing free, posttriangular field of the hind wing with at least one wing reaching from M_4 to Cu_1....*catenata*.

AA. Number of cells between the hind angle of the triangle and vein A_2 immediately opposite that angle on the hind wing *one*; at least one cell reaching from M_4 to Cu_1 on the same wing.

Discoidal triangle of the front wing 2-celled, internal triangle 3-celled. *athenais*.

Discoidal triangle of the front wing free.

E. Internal triangle of the front wing 3-celled. [*schumanni* of Mexico & Central America].

EE. Internal triangle of the front wing 2-celled.................*longifasciata*.

EE. Internal triangle of the front wing free.

The two posttriangular rows of the front wing increase to three at the level of the first postnodal...*macrocercis*.

The two posttriangular rows of the front wing increase to three distal to the level of the first postnodal.. ....*tibialis*, *eximia*.

151. **Micrathyria didyma hypodidyma** Calvert.

Micrathyria didyma hypodidyma Calvert, Biol. Centr.-Amer. Neurop. p. 224, footnote. 1906.

Micrathyria protæ Förster, Entomologisches Wochenblatt, xxiv, p. 153, 167. 1907.

The following additional material is at hand.

Habitat: — BRAZIL, Rio Grande do Sul, 2 ♂, 1 ♀. Rio de Janeiro, January, 2 ♂ and part of 1 ♂, November part of 1 ♂, undated 2 ♂ and part of 1 ♂, 1 ♀; H. H. Smith. Muniz Freire, Espiritu Santo, June 19, 1908, 1 ♂; J. D. Haseman.

PARAGUAY, Rio Parana, below Rosario, December 18, 1 ♀; H. H. Smith. All in the Carnegie Museum, Pittsburgh.

These specimens show considerable variation in the venation. There is only one cell between the hind angle of the triangle and A_2 immediately opposite that angle in both hind wings of 1 ♂ R. G. do Sul, and in one hind wing of 1 ♂ of R. d. Janeiro. The internal triangle of the front wings is two-celled in one wing each of 1 ♂ R.

G. d. Sul and 1 ♂ R. d. Janeiro. The discoidal triangle of the front wings is free in both wings of 1 ♂ R. G. d. Sul and one wing female R. G. d. Sul; both wings of 6 ♂, 1 ♀ and one wing of 1 ♂ R. d. Janeiro; both wings of 1 ♀ R. Parana; or 20 front wings out of 26, the remaining 6 having this triangle two-celled. There is at least one single cell reaching from M_4 to C_1 on one hind wing each of 1 ♂ R. G. d. Sul and of 1 ♀ R. Parana.

152. **Micrathyria didyma laevigata** subsp. nov.

♂. Agrees with *didyma* type in size and in the absence of pointed tubercles on the ventral surface of abdominal segment 1. Agrees with *didyma hypodidyma* in having "the brown stripes on the first and second lateral thoracic sutures so widened that their adjacent edges coalesce almost completely, thus forming one . . . brown stripe," 1 mm. wide, "enclosing a green vitta inferiorly," the external or anterior hamular branch "extending forward only to the level of (and not anterior to) the front edge of the anterior lamina." The superior appendages are intermediate between those of *didyma* type and *didyma hypodidyma*, being less robust than those of the first, more robust than those of the second, as well as being intermediate in the tendency to form a tooth at the last inferior denticle. There is also the venational difference stated in the table at the head of the genus in this paper.

Front wings with 12 antenodals, 9–10 postnodals, two posttriangular rows increasing to three at the level of the penultimate antenodal. Hind wings with 8–9 antenodals, 9–10 postnodals, two posttriangular rows increasing to three at the level of the separation of M_3.

♀. Here I also place individuals from Corumbá, in spite of the very different locality from which they come, because they agree with the preceding male in the color character stated, and in the venational characters of the table at the head of this genus, page 229, as well as with the structural female characters of *didyma*.

Front wings with 10–12 (11) antenodals, 7–9 (8) postnodals; hind wings with 8–9 (8) antenodals, 7–9 (8) postnodals. Posttriangular rows as above stated for the male, although the point of increase from two to three rows varies slightly. The only variation from the venational characters of the table of page 229 is that one female has the internal triangle of the left front wing three-celled instead of two-celled.

Dimensions: Abdomen ♂ 24.5, ♀ 21; hind wing ♂ 29, ♀ 27–29; costal edge of stigma, front wing, ♂ 2.5, ♀ 2.5–2.8 mm.

Habitat: — COLOMBIA, Don Diego in Department of Magdalena.

BRAZIL, Corumbá, in Matto Grosso, May, one female and parts of four others.

All the specimens collected by H. H. Smith, and in the Carnegie Museum, Pittsburgh.

153. **Micrathyria dythemoides** sp. nov.

(PLATE VII, FIG. 135.)

♂. Face and lips pale greenish-yellow, lateral labial lobes with a mesial (inner) black margin, one-sixth as wide as the lobe itself, and a narrower anterior black margin; free edge of labrum narrowly black; frons superiorly and vertex metallic-blue; occiput brown above, pale green behind, with a median vertical brown line; rear of head blackish-brown with two yellowish spots behind each eye-margin.

Hind lobe of prothorax slightly, but distinctly, bilobed in dorsal view.

Thoracic dorsum brown, a narrow yellowish antehumeral stripe on each side, distant at its upper end (which does not reach a transverse yellow stripe in front of the antealar sinus) from its fellow of the opposite side by 1.5 mm., and at its lower end by 2.5 mm.; the above-mentioned transverse yellow stripe confluent at its outer (lateral) end with a slightly wider complete sinuous yellow humeral stripe. Sides of the thorax predominantly greenish-yellow with three brown stripes, decreasing in width from before backward, the first bordering the humeral suture posteriorly, the second on the obsolete first lateral suture, the third on the second lateral suture; none of these three brown stripes forked, or anastomosing with each other.

Abdomen predominantly brown, becoming darker posteriorly; the following greenish-yellow: most of 1 and 2; a longitudinal stripe on each side of the dorsum of 3–7, reaching from the anterior end of each to nearly the entire length of 3; half of 4, one-third of 5 and less of 6 and two-thirds of 7, less than half as wide as the side of the dorsum on which it lies on 3–6 but on 7 so widened as to cover three-fourths of the width and to be separated from its fellow of the opposite side by the mid-dorsal carina only.

Superior appendages broken, brown. Inferior appendage slightly longer than 9 + 10 (= 1.6 mm.), triangular, its apex one-fifth as wide as its base.

Anterior lamina deeply bilobed, lobes separated by an interval more than half as wide as each lobe, apices not widened, truncate, almost smooth, equally as prominent as the inner branch of the two-branched hamule. Inner (posterior) branch of this latter, acute, terminating in a hook directed caudad and laterad; outer (anterior) branch apparently more prominent, badly damaged. Genital lobe less prominent than the other two parts, wider than long.

Legs blackish-brown, first femora green inferiorly.

Wings clear, venation dark brown, stigma ochre-brown. Front wings faint yellow at base half-way out to first antenodal and cubito-anal cross-vein; 12 antenodals, 9 postnodals; three posttriangular cells, followed by two rows increasing to three rows at the level of the last (left), or next to the last (right), antenodal. Hind wings yellow at base in subcostal area half-way to first antenodal, in cubital area to the cross-vein (brownish in the extreme proximal end of this area), thence in the anal area to the apex of the membranule, this last dark grey, white at its extreme base; 8 antenodals, 9–10 postnodals, two posttriangular rows between M_4 and Cu_1, increasing at the level of separation of M_3. Other venational details in the preceding table.

♀. Differs from the male as follows: face and lips more obscure, pale bluish-olive, where the male is greenish-yellow; brown of thorax with a metallic-blue reflection evident on the sides in the male; antehumeral yellow stripes not so distant at their lower ends (2 mm.); yellow stripe on each side of 4 reaching to three-fourth's length and on 5 to half-length. Appendages brown, as long as 9, more than twice as long as 10; apex acute; 11 (anal tubercle) more than half as long as the appendages. Vulvar laminare aching to two-fifthsof the lateral margin of 9, bilobed in its apical third, lobes broad, rounded, not reaching the style-like processes on the sternum of 9, which are about one-sixth as long as the lateral margin. Apices of the wings in to the distal end of the stigma pale brown. Front wings with 10–11 antenodals, 7–8 postnodals; the two posttriangular rows increasing to three rows at the level of the penultimate antenodal; hind wings with the yellow of the subcostal area reaching out to the first antenodal, that of the cubital area not brown proximally.

Abdomen ♂ 28.5?, ♀ 24, hind wing ♂ 33.5, ♀ 30, costal edge of stigma, front wing ♂ 2.8, ♀ 3 mm.

Habitat: — Surinam, 1 ♀, Paramaribo by Thorey, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

The abdomen widens but slightly and very gradually from the base of the third to the ninth segment, the latter 1.3 mm. wide, in the male, 1.5 mm. in the female. This feature, the colors, and the narrow pale antehumeral stripes give this insect a marked resemblance to the forms of *Dythemis velox* and have suggested the specific name proposed.

154. **Micrathyria atra** Martin.

Micrathyria atra Calvert. Biol. Centr.-Amer. Neurop., p. 225, pl. ix, figs. 13–15. 1906.

Habitat: — BRAZIL, Rio do Janeiro, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

This male has no single cell reaching from M_4 to Cu_1 on the left hind wing.

155. **Micrathyria spinifera** sp. nov.

(PLATE VII, FIG. 134.)

♂. Face and lips yellowish, becoming brownish with faint metallic-blue reflection on the upper surface of the frons; lateral labial lobes narrowly margined with blackish-brown mesially and anteriorly, free margin of labrum narrowly black in the middle, vertex brown with metallic-blue reflection; occiput brown, yellow behind.

Hind lobe of prothorax viewed from behind slightly, but distinctly, bilobed, bearing a row of long pale hairs.

Thoracic dorsum dark brown with a metallic blue-green reflection, a very narrow pale green antehumeral stripe reaching three-fifths of the way to the antealar sinus, parallel with the mid-dorsal carina and its fellow of the opposite side. Immediately in front of the green black-margined antealar sinus is a very fine isolated transverse pale green stripe. A pale green sinuous humeral stripe widening inward (mesad) at its lower half and confluent with the lower end of the above-described antehumeral stripe. Sides of the thorax predominantly pale green with the following dark brown stripes: one bordering the humeral suture posteriorly and enlarged in its upper half into a spot three times as wide as its lower half; a stripe on the obsolete first lateral suture and one on the second lateral suture, anastomosing with each other at the metastigma and again a short distance below the metastigma; the former also confluent with the posthumeral brown stripe at the lower end of the mesepimeron.

Abdomen narrowed at the base of segment 3 to 6 mm., thence widening to the base of 8 (2.5 mm.), thence narrowing to 10 (1.2 mm.), blackish, the following pale green or yellow: the sides of 1; a basal dorsal spot on 2; a stripe or spot on each side of 3–7, beginning at the anterior end of each segment, and reaching to one-third of 3, to a shorter distance on 5–6, and to one-half of 7; each of these stripes or spots on 3–7 is about half as wide as the half of the dorsum, on which it lies.

Superior appendages black, subequal to 9 + 10, in dorsal view fusiform, with acute apices converging toward each other; in profile view directed somewhat ventrad as well as caudad in the proximal two-thirds, upward in the distal third, with an inferior tooth at two-thirds length, proximal side of this tooth sloping very gradually and bearing about six denticles; distal side of tooth forming an angle of about 100° with the appendage, the apex of which is an acute spine.

Inferior appendage about five-sixths as long as the superior; viewed from below its distal half is much narrower (about half) than the proximal half, apex slightly emarginate.

Anterior lamina not developed (unless it be represented by a pair of slender short finger-like processes near the middle line of the front part of segment 2); its place supplied by the first abdominal segment, which is produced ventrad much more than usual and at first sight appears to be the true lamina. Hamule complicated, in profile view longer antero-posteriorly than high, at its anterior end with two acute spine-like processes, both directed somewhat forward (cephalad), one directed ventrad, the other dorsad and apparently applied against one of the finger-like representatives (?) of the anterior lamina; at its hind end the hamule has a slender curved process applied against its fellow of the opposite side and directed caudad, laterad, and slightly dorsad; this last process is the most prominent part of the hamule in profile view. In ventral view the right and left hamules enclose a somewhat elongated opening closed before and behind; the ventral surface of each hamule is grooved for its entire length. Genital lobe produced vertically, so as to be subequally as prominent as the posterior hamular process, narrowing to its rounded apex chiefly on its posterior side.

Legs blackish.

Wings pale dirty yellow, slightly more intense along the anterior margins, hardly darker at the bases. Venation and stigmata dark brown or black, membranule brown. Front wings with 10–11 antenodals, 8–9 postnodals, two posttriangular rows increasing to three a little distal to the level of the nodus. Hind wings with 7–8 antenodals, 9 postnodals, two posttriangular rows increasing to three near the level of separation of M_3. Other venational details in the preceding table.

Abdomen (segment 4 lost) 28 ?, hind wing 27, costal edge of stigma, front wing, 2.5 mm.

♀ Unknown.

Habitat: SURINAM, 1 ♂, Thorey. Museum of Comparative Zoölogy, Cambridge, Mass.

The specific name proposed refers to the structure of the genital hamule, which is very distinctive.

156. **Micrathyria oscellata dentiens**, subsp. nov.

(PLATE VII, FIG. 130.)

♂♀ Brown stripe on the first lateral thoracic suture forked in its upper half, brown metepimeral stripe running off from near the lower end of the second lateral suture and reaching to the posterior margin of the sclerite. Pale green antehumeral stripes not reaching to the transverse green stripe in front of the antealar sinus.

♂ Abdominal segments 3–6 with a longitudinal yellow stripe on each side reaching from the base of each segment to more than half its length, although interrupted more or less by the transverse additional carina (3), or suture (4–6), the part behind always narrower than that in front of the carina or suture, or these stripes entirely absent from 6.

Superior appendages with the proximal inferior tooth situated nearer to the middle than two-fifths length, more prominent than the distal tooth and more prominent than in the type of *ocellata* from Ecuador or than in the Central American race of this species.

♂♀. Front wings with 8–9 (8) ♂, 7–9 ♀ antenodals, hind wings with 6 ♂♀; yellowish-brown on the base of the latter reaching to the cubito-anal (= submedian, de Selys) cross-vein, or not so far. Tips of all the wings uncolored.

Abdomen ♂ 21.5–23, ♀ 19–20.5; hind wing ♂ 23.5–25.5, ♀ 25–26; costal edge of stigma, front wing, ♂ 2–2.2, ♀ 2.3–2.6 mm.

Habitat: — BRAZIL, Bom Fim, November 2, 1907, 2 ♂, and Barreiras, January 4, 1908, 1 ♂, in the State of Bahia; Muniz Freire, Espiritu Santo, June 17, 1908, 2 ♀. All by J. D. Haseman. Carnegie Museum, Pittsburgh.

This subspecies agrees more closely with the Central American form [35] of the species than with the type form from Ecuador in all of the differences separating these two given in Biologia Centrali-Americana, Neuroptera, page 226. *Ocellata dentiens* differs from both in the greater prominence of the proximal inferior tooth of the superior appendages and from *ocellata quicha* in the brown stripes of the sides of the thorax being wider than shown in B. C.-A. Neur. pl. IX, fig. 22.

The right front wing of one male from Bom Fim, and both front wings of one female from Muniz Freire have the internal triangle three-celled. Otherwise all five specimens agree with the venational features given in the table on page 229.

157. **Micrathyria catenata** sp. nov.

♂. Lips yellow, free margin of labrum, inner (mesial) margins of lateral labial lobes, and a median stripe on the middle lobes blackish. Frons and clypeus pale green, the former metallic-blue superiorly and extending down on to the anterior surface in the middle line, but not on the sides. Vertex metallic-blue, its tip yellow.

Thorax chiefly blackish-brown, the following pale green: a narrow stripe on each side of the mid-dorsal carina, each confluent superiorly with a transverse green stripe immediately in front of the antealar sinus (which also is green), thus forming an inverted L; a narrow antehumeral stripe extending from the anterior mesepisternal margin halfway up toward the antealar sinus; a wider, sinuous, indistinct, broken humeral stripe; a still wider mesepimeral stripe and one in front of the second lateral thoracic suture, both of which are interrupted a little above mid-height, and are narrower above the interruption; a metepimeral stripe bordering the latero-ventral suture and nearly half as wide as its sclerite.

Abdomen narrowed from 2 to the base of 4, thence widening gradually to the hind end of 7 (2 mm.), thence narrowing to 10, blackish; a pale green stripe on each side of the dorsum of 3–6, half as wide (or less) as the side of the dorsum on which it lies, interrupted on each segment by the additional transverse carina or suture, and reaching back to at least half the length of each segment. 7 with a large green spot on each side, separated from its fellow of the opposite side by a dark interval one-third its own width, reaching from anterior end to four-fifths of the length of the segment.

Superior appendages in dorsal view as long as 9 + 10, black, slender, approximated, converging by a slight curve throughout, with very acute spine-like apices; in profile view thickest at two-thirds length, where the inferior surface bears a small tooth, from which runs forward a row of denticles along the outer edge of the inferior surface to within one-third of the appendage-length; distal third of the appendage directed upward, apex very acute.

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[35] For which the name *Micrathyria ocellata quicha* (from that of a human tribe) may be suggested.

Inferior appendage reaching to three-fourths of the length of the superiors; in ventral view its distal two-fifths is strongly contracted, apex one-fourth as wide as the base.

Anterior lamina slightly more prominent than any other of the genitalia of segment 2, its apex entire, slightly convex when viewed from in front. Hamule hook-like, directed caudad, more prominent than the genital lobe, which latter is wider than long.

Wings with only the slightest tinge of ochraceous at the extreme bases, on the hind wings greater, but reaching only one-third way out to the cubito-anal cross-vein. Front wings with 8 antenodals, 7 postnodals, two postriangular rows increasing to three near the level of the nodus. Hind wings with 6 antenodals, 8 postnodals. Other venational details on page 229.

Abdomen 25, hind wing 24 mm.

♀ unknown.

Habitat: BRAZIL, Minas Geraes, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

158. **Micrathyria athenais** sp. nov.

♂. Lips yellow, free labral margin narrowly black; submentum, mentum, middle labial lobe, inner (mesial) third, or more of lateral labial lobes, black. Clypeus and inferior margin of the frons pale green, remainder of frons and vertex metallic-blue.

Thorax and abdomen blackish, pruinose; indications of paler color on the mesinfraepisternum. Abdomen narrowing to 4, thence widening to the hind end of 7 as usual in this genus.

Superior abdominal appendages as long as 9 + 10, black, in dorsal view nearly straight, converging, apices acute; in profile view directed downward to four-fifths' length, where the inferior surface bears a small tooth the proximal side of which bears a row of 4–5 denticles, distal fifth directed upward, apex acute. Inferior appendage reaching to nine-tenths of the length of the superiors, its apex in ventral view one-fourth as wide as its base.

Anterior lamina much less prominent than either of the other two ordinarily visible genitalia of segment 2, its margin entire. Genital hamule subequally, or a little less prominent than the genital lobe, in profile view resembling that of *M. æqualis* in being wider at its apex, in ventral view its outline presents the form of a U the outer limb of which is a little longer than the inner, the convexity of the U being anterior. Genital lobe wider than long.

Wings practically uncolored; under a lens a very slight trace of ochraceous is visible at the extreme base of the hind pair.

♀. Differs from the male as follows: frons (except the inferior margin) and vertex reddish-yellow or reddish-brown, with some blue reflections. Thoracic dorsum dark brown, a medial greenish-yellow band, one-fourth to two-fifths as wide as either mesepisternum, continued forward on the prothorax and backward over the interalar area. Sides of the thorax brownish-yellow; a sinuous line on the humeral suture, a nearly straight stripe on the second lateral suture, the lower half of the metepisternum (enclosing a round yellow spot), much of the metepimeron, and the pectus, black. Abdomen yellow, becoming brownish posteriorly; a stripe bordering each lateral carina of 1–7, the mid-dorsal carina of 4–7, a transverse line on the hind ends of 2–7, most of 8–10, except the intersegmental articulations and a linear mark on each side of the dorsum of 8, black. Appendages as long as 9, three times as long as 10. Vulvar lamina reaching to the middle of the lateral margin of 9, with a rather shallow median notch. Style-like process of 9 apparently lost. Wings slightly obscured throughout, pale ochraceous in the subcostal and cubital spaces, as far as the first cross-vein of each.

♂♀. Front wings with 10 antedodals (11 in one wing of 1 ♂ = 5.5 per cent. ♂), hind wings with 7 (8 in one wing of 1 ♂ and in one wing of 1 ♀). The only variations from the venational features given in the synopsis on page 229 are that no one cell reaches from M_4 to Cu, on the hind wings in two wings ♂ and two wings ♀; and that the discoidal triangle is free in the front wings of 1 ♂.

Dimensions: abdomen ♂ 23–26, ♀ 22.5; hind wing ♂ 27–31, ♀ 28–28.5 mm.

Habitat: — BRAZIL, Chapada, in May, by H. H. Smith, 4 ♂ and parts of 2 ♂, 1 ♀ and part of 1 other, some labeled, all presumably from the same locality. Carnegie Museum, Pittsburgh.

A male labeled "*Lib. athenais Selys Brésil*" in de Selys' hand; 2

♂ labeled "*Beschke*" and "*gerula.*" Museum of Comparative Zoölogy, Cambridge, Mass. These latter two are doubtless the *Dythemis gerula* from Nova Friburgo, Brazil, of Hagen's List of South American Neuroptera in his Synopsis of 1861, page 317. They are younger than the other males, and have an orange spot on each side of the dorsum of abdominal segment 7, each spot about three-fifths as long and half as wide as the side on which it lies.

159. **Micrathyria longifasciata** sp. nov.

♂. Lips yellow, mesial margins of lateral labial lobes narrowly black. Clypeus and frons pale green, the latter metallic-blue above only in the center in front of the median ocellus for a width of 1 mm. Vertex metallic-blue. Occiput and rear of head shining black, a small yellow spot and streak behind each eye.

Thorax brown, or dull metallic-blue or -green obscured by some pruinosity, the following pale green: a narrow stripe on each side of, and close to, the upper half of the mid-dorsal carina, confluent above (or not confluent — Piedra Blanca) with a narrow transverse stripe in front of the antealar sinus; a narrow isolated antehumeral stripe occupying the middle third of the length of the mesepisternum (absent in the Piedra Blanca ♂); a nearly horizontal band, extending from the lower part of the mesepisternum and the mesinfraepisternum to the base of the abdomen; the average width of this band is slightly more than 1 mm., its upper edge is markedly zigzag with five points or "peaks"; pectus. Thorax and rear of the head with many pale hairs.

Abdomen narrowed to the anterior end of 4, thence widened to the hind end of 7 (2.5 mm.), thence narrowed to 10; black, pruinose at base, on 4 and 5 (and perhaps also 3 in earlier life); each side of dorsum with a linear yellowish spot at base and a yellowish longitudinal line after the transverse accessory suture (the line absent from 5 in the Piedra Blanca ♂); 7 with a yellowish spot on each side of dorsum, each spot three-fifths as long and three-fifths as wide as the side on which it lies, and separated from its fellow of the opposite side by the black mid-dorsal carina only.

Superior appendages a little longer than the mid-dorsal length of 9, brown in the proximal three-fifths, pale (green?) in the distal two-fifths, slender, in dorsal view slightly thickened at base and at two-thirds' length, apex acute; in profile view curved gently downward, convex above, a row of about six denticles on the inferior surface in the third and fourth fifths of the appendage-length; following the last denticle the inferior margin is obliquely truncated to form the acute apex; there is a slight infero-internal denticle immediately after the base.

Inferior appendage reaching to slightly beyond the level of the last denticle of the superiors, in ventral view its apex one-third as wide as its base.

Genitalia of abd. seg. 2 very similar to those of *M. athenais* (see above).

Legs black, coxæ yellowish, first femora greenish inferiorly in their proximal half.

Hind wings yellow in the cubital space half-way (or all the way—Piedra Blanca) out to the cross-vein and in the two cells immediately adjoining the grayish membranule.

♀. Differs from the male as follows: metallic-blue on superior surface of frons still more reduced, forming a small triangular spot in front of the median ocellus; reddish-brown replacing black on the occiput and rear of the head; pale green stripes alongside of the mid-dorsal thoracic carina as long as the carina, anastomosing at the anterior mesothoracic margin with the anterior (lower) ends of the longer antehumeral stripe and of the almost horizontal band; this last much less definite owing to the predominance of pale green on the sides of the thorax, there being from in front of the humeral suture only the following dark markings: a short stripe on the upper parts of the humeral and second lateral sutures, an inverted V-mark on the upper half of the mesepimeron, a triangular spot on the lower end of the mesepimeron and of the metepimeron, a smaller spot on the metinfra-episternum. Abdominal segments 1–3 green, their sutures and carinæ black; 4 and 5 as in the male, but the spot and stripe wider (half as wide as the side of the dorsum on which they lie) and the stripe reaching to the hind end of each segment; 6–10 lost. Yellow at the base of the hind wings reaching distad a little beyond the cubito-anal cross-vein, apices of all the wings from about the level of the proximal end of the stigma faintly brownish.

♂♀. Front wings with 8–9 antenodals, and two posttriangular rows increasing to three between the levels of the last and the next to last antenodals. Hind wings with 6 antenodals. All four specimens agree with the venational features given in the synopsis on page 229.

Dimensions: Abdomen ♂ 33, ♀ ?; hind wing ♂ 23–26, ♀ 25 mm.

Habitat: — BRAZIL, Cuyabá, 1 ♂ (head lacking); Corumbá, May, 1 ♀ (abd. segs. 6–10 lacking).

BOLIVIA, Piedra Blanca, April, 1 ♂ (abd. segs. 6–10 lacking).

ARGENTINA, Goya, east side of the Rio Paraná, December 22, 1 ♂.

All four specimens by H. H. Smith. Carnegie Museum, Pittsburgh.

The Goya male is the type of the species. The Piedra Blanca male is the smallest of its sex.

The specific name proposed refers to the very characteristic, almost horizontal, pale green band of the sides of the thorax.

160. **Micrathyria macrocercis** sp. nov.

(PLATE VII, FIG. 136.)

♂. Lips yellow, mesial margins of lateral labial lobes narrowly black. Clypeus and frons pale green, the latter with a small superior triangular brown spot, with metallic-blue reflections in front of the median ocellus. Vertex metallic-blue. Occiput and rear of head shining black, the former with two small pale green posterior spots.

Thoracic dorsum dark metallic-green-brown, the dark mid-dorsal carina bordered on each side with a pale green stripe, one-fifth as wide as the mesepisternum on which it lies, and confluent above with a narrower transverse stripe in front of each antealar sinus; a minute isolated antehumeral green line on the center of the sclerite. Sides of the thorax pale green, a short stripe on the upper halves of the mesepimeron, metepisternum, and second lateral thoracic suture, a spot above the metastigma, one on the lower ends of the mesepimeron and of the metepimeron, blackish.

Abdomen of the usual shape, blackish, 2–7 with a stripe on each side nearly as long as each segment (except on 2) and half as wide as the side of the dorsum on which it lies, pale green on 2 and 3, almost orange on 4–7.

Superior appendages (1.8 mm.) almost as long as 8 + 9, longer than 9 + 10, very slender, in dorsal view almost straight, pale green in the middle, brown at both ends, slightly thickened at two-fifths' length, thence gradually tapering to the very acute apices; in profile view gently curved downward, so that the upper margin is concave, but the extreme apex more strongly decurved; inferior surface at two-fifths' length with a slight tooth, between which and the base are 5–6 denticles.

Inferior appendage half as long as the superiors, its apex in ventral view one-third as wide as its base, ochreous.

Anterior lamina extremely small, hamule and genital lobe subequally prominent, the former bifid, outer branch longer.

Wings uncolored, antenodals of all the wings and some adjoining cross-veins pale yellow, much of the remaining venation reddish, stigma pale yellow. Front wings with 8 (7 in one wing) antenodals, hind wings with 6.

Abdomen 17.5, hind wing 18–18.5 mm.

♀ unknown.

Habitat: — Brazil, Cachoeira, 1 ♂, no. 36; Cuyabá, 1 ♂ (abd. segs. 6–10 lost); both by H. H. Smith. Carnegie Museum, Pittsburgh.

Paraguay, Sapucay, by W. T. Foster, November 1 ♂, December 1 ♂, U. S. National Museum.

161. **Micrathyria tibialis** Kirby.

Micrathyria tibialis Kirby, Ann. Mag. Nat. Hist. (6) xix, p. 610, pl. xiii, figs. 5, 6 (entire insects ♂, ♀). 1897.

Habitat: — Brazil, Bonito, in Pernambuco, December 30, 1882, 1 ♂. U. S. National Museum.

Rio Grande do Sul, 1 ♀; Uacaryzal, 1 ♂, 1 ♀; Cachoeira, 1 ♂ no. 51.

Bolivia, Piedra Blanca, April, 1 ♂, 1 ♀ and parts of two others.

Paraguay, Concepcion, 1 ♀.

All but the Bonito ♂ by H. H. Smith. Carnegie Museum, Pittsburgh.

162. **Micrathyria eximia** Kirby.

Micrathyria eximia Calvert, Biol. Centr.-Amer. Neurop., p. 230, pl. ix, figs. 28–30 (genit., apps., ♂, venation ♀). 1906.

Habitat: — Brazil, Cuyabá, 1 ♂; Chapada, 3 ♂ and part of 1 other, no. 36; Cachoeira, 1 ♂, no. 52; all by H. H. Smith. Carnegie Museum, Pittsburgh.

Minas Geraes, 1 ♂; Rio de Janeiro, by Reinhardt, 1 ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

163. **Nephepeltia flavifrons** Karsch.

Nephepeltia flavifrons Calvert, Biol. Centr.-Amer. Neurop., p. 230. 1906.

Habitat: — Brazil, Rio Grande do Sul, by H. H. Smith, 1 ♀ and part of 1 ♂. Carnegie Museum, Pittsburgh.

The thorax of the female is almost entirely yellow; abdominal segments 6–10 are a little wider than those preceding.

Agreeing with the characters given here and in the text quoted, but of smaller size (in this respect closely approaching the next species), are 2 ♂ from Barreiras, State of Bahia, January 4, 1908, by J. D. Haseman, 1 ♂ from Cuyabá and 1 ♂ (no. 42) from Cachoeira by H. H. Smith. Carnegie Museum, Pittsburgh.

164. **Nephepeltia æquisetis** sp. nov.

Triangular area on the metasternum with only a small tubercle; front wing with one cell between the internal triangle and hind margin; third tibia of the male with the spines of the outer and inner rows subequal in size and number (10–13); tooth of the inferior surface of the superior appendages at three-fourths of the appendage-length, beyond which tooth the remainder of the appendage is hardly curved upward, but tapers to an acute apex. (In *N. flavifrons* the tooth is at mid-length, the distal half of the appendage is distinctly curved upward, and remains of almost the same thickness to the short spine, which forms the apex). Inferior appendage reaching almost to the level of the tips of superiors (only to three-fourths length in *flavifrons*). Both sexes have the abdomen widened in segments 7–10.

Dimensions: abdomen ♂ 12–13.5, ♀ 12.5–13; hind wing ♂ 15–16, ♀ 15–17.

Habitat: — BRAZIL, Cuyabá, 11 ♂, 11 ♀; Cachoeira, 1 ♂, 2 ♀, no. 6., also 1 ♂ "flooded campos," January 26; Chapada, 1 ♀; Corumbá, April, 3 ♂, 3 ♀.

BOLIVIA, Piedra Blanca, April, 2 ♂, 1 ♀.

All by H. H. Smith, Carnegie Museum, Pittsburgh.

165. **Orthemis ferruginea** Fabricius.

Orthemis ferruginea Calvert, Biol. Centr.-Amer. Neurop. pp. 234, 403, pl. ix, fig. 34. 1906, 1907.

Habitat: — COLOMBIA, Bonda, in November, by H. H. Smith, 1 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

VENEZUELA, La Guaira, July 27, 1900, by Lyon and Robinson, 10 ♂, 5 ♀.

BOLIVIA, near Coroico, Yungaz, May 31, 1899, by W. J. Gerhard, 1 ♂. Academy of Natural Sciences, Philadelphia.

BRAZIL, Victoria, July 20, 1900, by A. Hempel, 1 ♀. Academy of Natural Sciences, Philadelphia.

Januariá, in Minas Geraes, December 12, 1907, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, November to March, by W. T. Foster, 15 ♂, 7 ♀. U. S. National Museum.

BAHAMAS, Eleuthera, April 11–21, 1897, by C. J. Maynard, [November 14, 1890, 1 pair in coitu]; New Providence, vicinity of Nassau, June 28–July 1, 1904, by Allen, Barbour, and Bryant, 2 ♂; Andros, Mangrove Cay, August 1, 1904, by O. Bryant, 2 ♂; Cat, Port Hour, [Nov. 21, 1890, 1 ♂]. The specimens in brackets [] by J. P. Moore and D. J. Bullock, University of Pennsylvania Expedition; the others in the Museum of Comparative Zoölogy.

166. **Orthemis æquilibris** sp. nov.

♀. Belonging to the group of *O. ferruginea* and *sulphurata* (group A, Biol. Centr.-Amer. Neurop., p. 232). Labium yellow, with a median dark brown band 2–2.5 mm. wide, femora and tibiæ superiorly reddish-brown, tip of wings clear or smoky. Sides of thorax brown, somewhat purplish in some, with two horizontal longitudinal greenish or greenish-yellow bands; the upper 1–1.2 mm. wide, beginning on the upper end of the mesinfraepisternum and lower end of the mesepisternum and extending to the upper half of the hind margin of the metepimeron, slightly interrupted at the humeral and second lateral sutures; from the band a short slender indistinct stripe runs upward bordering the humeral suture anteriorly; the lower band, .3–.6 mm. wide, borders the latero-ventral metathoracic carina for its whole length, and is continued forward to the base of the second leg by two separated larger spots. Mid-dorsal thoracic carina and a narrow contiguous stripe on each side thereof greenish-yellow, the whole forming a band .8–1 mm. wide. Abdomen moderately stout, 2.7–3.5 mm. wide at the base of 4, this segment 1.4 times as long as wide. Labrum orange, free margin, and a transverse (to long axis of *body*) median mark of variable length, black.

Abdomen 28–33, hind wing 38–43 mm.

♂. Unknown.

Habitat: — SURINAM, 2 ♀. U. S. National Museum.

Paramaribo, by Miss Kate Mayo, 2 ♀, one dated December 18, 1904. Academy of Natural Sciences of Philadelphia.

VENEZUELA, 1 ♀. U. S. National Museum.

BRAZIL, Bom Fim in Bahia, November 3, 1907, at north edge of town, 1 ♀; Muniz Freire, in Espiritu Santo, June 17, 1908, 1 ♀; Sete Lagoas, in Minas Geraes, May 4, 1908, 1 ♀; all by J. D. Haseman. Carnegie Museum, Pittsburgh.

One of the Paramaribo examples is the type.

The two females from Surinam, in the U. S. National Museum, are the smallest, and have the stigma of the front wings only 5.5 mm. long, which is less than the dimensions given in the "Biologia" volume quoted for group A.

167. **Orthemis ambirufa** sp. nov.

♂. Belonging to the group of *O. levis* (group CC, Biol. Centr.-Amer. Neurop., p. 233). Abdomen stouter, segment 4 being 2.8 times as long as its width at apex, 3.2 times as long as its width at base. Labrum reddish; abdomen reddish; no black on the dorsum of 8–10. Thorax somewhat faded, its color-pattern very similar to that figured for *levis* (*l. c.*, pl. viii, fig. 38), differing chiefly in the absence of the first pale antehumeral stripe, and the more uniform width of the pale mesepimeral stripe (about 1 mm.). Genitalia of the second abd. seg. apparently not different.

Abdomen 34, hind wing 38 mm.

♀ unknown.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

168. **Orthemis ambinigra** sp nov.

♂. Belonging to the group of *O. levis* (group CC, Biol. Centr.-Amer. Neurop., p. 233). Abdominal segment 4 three times as long as its width at apex; segments 8 and 9 with a mid-dorsal black band about one-third as wide as 8, a little wider on 9. Labrum black. Thorax much faded, its color-pattern probably similar to that of *ambirufa*. Genital hamule with the external branch wider than in *O. levis* or in *O. ambirufa*. (Cf. Biol. Centr.-Amer. Neur., pl. ix, fig. 39.)

Abdomen 32, hind wing 35 mm.

♀ unknown.

Habitat: — BRAZIL, Rio de Janeiro, in January, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

169. **Orthemis cultriformis** Calvert.

Orthemis cultriformis Calvert, Biol. Centr.-Amer., Neurop., p. 239. 1906.

PARAGUAY, Sapucay, by W. T. Foster, November and December, 1899, 7♂ 3♀. U. S. National Museum.

170. **Cannaphila vibex** Hagen.

Cannaphila vibex Calvert, Biol. Centr.-Amer. Neurop., p. 243, pl. viii, fig. 35. 1906.

Habitat: — COLOMBIA, Onaca, August, 2 ♂, December, 4 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

BOLIVIA, Chulumani, November 28, 1898, 1 ♂, and January 5, 1899, 1 ♀, by W. J. Gerhard. Academy of Natural Sciences of Philadelphia.

171. **Dasythemis mincki** Karsch.

(*Cf.* Ris, Deut. Ent. Zeitschr. 1908, p. 528.)

Habitat: — BRAZIL, Rio Grande do Sul, by H. H. Smith, 2 ♂, 2 ♀. Carnegie Museum, Pittsburgh.

172. **Dasythemis venosa** Burmeister.

Dasythemis venosa Calvert, Trans. Amer. Ent. Soc. xxv, p. 58, pl. i, fig. 7. 1898.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♂ and parts of 10 others; 3 ♀ and parts of 3 others, some dated May, some December, some labelled 6, 19, 33, or 44. Carnegie Museum, Pittsburgh.

173. **Anatya normalis** Calvert.

Anatya normalis Calv., Biol. Centr.-Amer. Neurop., p. 245. 1906.

Habitat: — COLOMBIA, Bonda, August, 1 ♀; Don Diego, not dated, 2 ♀, by H. H. Smith. Carnegie Museum, Pittsburgh.

174. **Anatya guttata** Erichson.

Anatya guttata Calvert, *l. c.* 1906.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 4 ♂ and parts of 4 others; 6 ♀ and parts of 1 (or 5?) others. Carnegie Museum, Pittsburgh.

175. **Erythrodiplax umbrata** Linnæus.

Erythrodiplax umbrata Calv., Biol. Centr.-Amer. Neurop., p. 251. 1906.

Habitat: — COLOMBIA, Bonda, July, 1 ♀, August, 5 ♂, 6 ♀, September, 3 ♂, 2 ♀, October, 1 ♂, 1 ♀, November, 2 ♀, by H. H. Smith.

BRAZIL, Campo Largo, January 1, 1908, 1 ♂, 1 ♀; Urubú, December 8, 1907, 1 ♂; Boqueiraõ, January 7, 1908, 1 ♂, 1 ♀; all in Bahia, by J. D. Haseman.

Cachoeira Cuyabá, January 26, 1 ♂; Rio de Janeiro, January, 1 ♀; by H. H. Smith.

The preceding in the Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, September, 1902, 4 ♂, December, 1899 and 1903, 9 ♂, 7 ♀, January to March, 1900, 5 ♂, 2 ♀. U. S. National Museum.

BAHAMAS, Strange Cay, July 14, 1904, by Allen, Barbour, and Bryant, 2 ♂, 1 ♀ and 1 homœochromatic ♀. New Providence, vicinity of Nassau, June 28–July 1, 1904, by the same, 2 ♂, 1 ♀. Andros, Mangrove Cay, August 1, 1904, by O. Bryant, 3 ♂. All in Museum of Comparative Zoölogy, Cambridge, Mass.

176. **Erythrodiplax ochracea** Burmeister.

Erythrodiplax ochracea Calv., *l. c.*, p. 255. 1906.

Habitat:—BRAZIL, Barreiras, in Bahia, January 4, 1908, 3 ♂ (2 ♀?); Sąõ Joas da Barra (near Rio Parahyba), June 24, 1908, 1 ♂; Ururahy, June 30, 1908, 1 ♂; by J. D. Haseman. Carnegie Museum, Pittsburgh.

Farther south this species appears to be represented by smaller individuals, 3 ♂, 6 ♀ (abdomen ♂ 19, ♀ 17.5; hind wing ♂ 22, ♀ 21 mm.) from Piedra Blanca, in Bolivia, by H. H. Smith, and perhaps some slightly larger (abd. 19, h. w. 22) females from Concepcion, Paraguay, by the same collector, also belong here. Carnegie Museum, Pittsburgh.

177. **Erythrodiplax erichsoni?** Kirby.

Erythrodiplax erichsoni? Calv., *l. c.*, p. 256. 1906.

Habitat: — COLOMBIA, Don Diego, 2 ♂.

BRAZIL, Rio de Janeiro, in November, 1 ♂. H. H. Smith. Carnegie Museum, Pittsburgh.

178. **Erythrodiplax venusta** Kirby.

Micrathyria venusta Kirby, Ann. Mag. Nat. Hist. (6) xix, p. 612, pl. xiii, fig. 1. 1897.

Habitat: — BRAZIL, Cachoeira, part of 1 ♂, no. 47, by H. H. Smith. Carnegie Museum, Pittsburgh.

179. **Erythrodiplax connata** Burmeister.

Erythrodiplax connata Calvert, Biol. Centr.-Amer. Neurop., p. 259. 1906.

form *d*. Calvert, *l. c.*, p. 260.

Habitat: — BRAZIL, Desterro, December, 1 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

form *e*. Calvert, *l. c.*, p. 261.

COLOMBIA, Bonda, July, 1 ♀, August, 5 ♂, 1 ♀, September, 1 ♂, 1 ♀, October, 10 ♂, November, 2 ♂, 5 ♀, December, 2 ♂, 2 ♀, January 1 ♂, 1 ♀; Onaca, August, 1 ♂, 1 ♀, December, 1 ♂; by H. H. Smith. Carnegie Museum, Pittsburgh.

VENEZUELA, La Guaira, July 27, 1900, by Lyon and Robinson, 2 ♂, 1 ♀. U. S. National Museum.

BRAZIL, Chapada, 22 ♂, 1 ♀, some dated December, some numbered 24, 25, 44, 101, 102, 103, 107, and 117 by the collector; Rio Grande do Sul, 2 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, September, 1902, 2 ♂, November, 1901, 1 ♂, December, 1899, 1901, 1902, 10, ♂, 3 ♀, March, 1900, 1 ♂. U. S. National Museum.

form *b'*. Calvert, *l. c.*, p. 264.

BRAZIL, Chapada, 33 ♂, 10 ♀, more or less perfect, some dated May, some December, some numbered 21, 58, 59, 104, 131, 133*a*, 135, and 181 by the collector, H. H. Smith. Carnegie Museum, Pittsburgh.

180. **Erythrodiplax minuscula** Rambur.

Erythrodiplax minuscula Calvert, *l. c.*, p. 267. 1906.

Habitat: — BRAZIL, Chapada, 27 ♂, 14 ♀, some dated May, some December; some numbered 52 or 131 by the collector; Corumbá, May, 1 ♂; Cuyaba, lakes, January, 1886, 3 ♂, 6 ♀; Cachoeira, Cuyabá Lagoa, January 29, 6 ♂, 8 ♀, some numbered 44 or 45, Rio Grande do Sul, 1 ♂.

BOLIVIA, Piedra Blanca, April, 3 ♂.

All by H. H. Smith. Carnegie Museum, Pittsburgh.

181. **Erythrodiplax berenice næva** Hagen.

Erythrodiplax berenice næva Calvert, *l. c.*, p. 270. 1906.

Habitat: — BAHAMAS, Andros Island, Mangrove Cay, August 2, 1904, by O. Bryant, 1 ♂, 3 heterochromatic ♀. Museum of Comparative Zoölogy, Cambridge, Mass.

182. **Dythemis velox** Hagen.

Dythemis velox Calvert, Biol. Centr.-Amer. Neurop., p. 272. 1906.

Habitat: — COLOMBIA, Bonda, July, 1 ♂, August, 2 ♂, November, 2 ♂, 1 ♀.

BRAZIL, Rio de Janeiro, May, 1 ♂, November, 1 ♀. Rio Grande do Sul, 1 ♂.

All the preceding by H. H. Smith. Carnegie Museum, Pittsburgh.

Muniz Freire in Espiritu Santo, June 17, 18, 1908, by J. D. Haseman, 1 ♂, 1 ♀. Carnegie Museum.

PARAGUAY, Sapucay, by W. T. Foster, November, 1899, 1 ♂, January, 1900, 2 ♂. United States National Museum.

183. **Dythemis constricta** Calvert.

Dythemis constricta Calv., Proc. Bost. Soc. Nat. Hist. xxviii, p. 311, pl. i, fig. 16. 1898.

Habitat: — BRAZIL, Bom Fim in Bahia, at the Fazenda de Amaratu, November 21, 1907, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

184. **Dythemis cannacrioides** Calvert.

Dythemis cannacrioides Calv., Biol. Centr.-Amer. Neurop., pp. 276, 405, pl. viii, figs. 43, 44, pl. x, fig. 13. 1906, 1908.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 4 ♂, 1 ♀. The Carnegie Museum, Pittsburgh.

185. **Brechmorhoga præcox** Hagen.

Brechmorhoga præcox Calvert, *l. c.*, pp. 281, 405, pl. viii, fig. 49. 1906, 1908.

Habitat: — COLOMBIA, Bonda, July, 2 ♂, 2 ♀, November, 1 ♂, 1 ♀, December, 1 ♂, 2 ♀; Onaca, November, 1 ♀; by H. H. Smith. Carnegie Museum.

The November male tends toward *B. postlobata* Calvert.

186. **Brechmorhoga prædatrix** sp. nov.

♂. Closely related to *B. præcox*. Agreeing with the characters of this species, as given in the Synopsis for the genus, Biol. Centr.-Amer. Neurop., pp. 278, 279, under the rubrics A, B (except that the genital lobe is half as prominent as the anterior lamina, pale mark on each side of the dorsum of 7 a stripe one-fourth as wide, or less, as the half of the segment on which it lies), C and DD (except that the labrum has a median, and on each side a lateral, brown spot, while the hamule is shaped almost as in *nubecula*, but its apex is not quite so acute). The hind wings have two posttriangular rows beginning at the triangle.

Abdomen 34–37, hind wing 30–31 mm.

♀ unknown.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 5 ♂. Carnegie Museum, Pittsburgh.

187. **Brechmorhoga nubecula** Rambur.

Brechmorhoga nubecula Calvert, Biol. Centr.-Amer. Neurop., p. 285. 1906.

Habitat: — COLOMBIA, Onaca, August, 1 ♂.

BRAZIL, Rio de Janeiro, November, 2 ♂, 5 ♀, December, 1 ♂, 1 ♀; Chapada, November, part of 1 ♂, December, 2 ♂, 1 ♂. All the preceding by H. H. Smith, Carnegie Museum, Pittsburgh.

Sete Lagoas in Minas Geraes, May 7, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum.

188. **Brechmorhoga inequiunguis** Calvert.

Brechmorhoga inequiunguis Calvert, Biol. Centr.-Amer. Neurop., pp. 286, 406. 1906, 1908.

Habitat: — COLOMBIA, Onaca, in December, by H. H. Smith, 1 ♂.

BRAZIL, Rio de Janeiro, November, by the same, 2 ♂. All 3 ♂, Carnegie Museum, Pittsburgh.

189. **Brechmorhoga heteronycha** sp. nov.

(PLATE IX, FIG. 147.)

♂ ♀. Internal triangle of the front wing more often 2-celled; hind wing with more often 1 (♂) or 2 (♀) posttriangular rows; 1 cell between the hind angle of the triangle and A_2 immediately opposite; 2 rows of cells between and parallel to A_3 and the anal angle; 1 anal cell between the hind angle of the triangle and the point of origin of A_2; two cubito-anal cross-veins. Wings faintly yellow, venation orange and yellow. Frons pale green and deeply bifid superiorly, forming two divergent, almost conical tubercles, thus resembling the frons of *Gomphomacromia paradoxa*, pale luteous anteriorly. Legs pale brownish-yellow. Abdomen not widened on the posterior segments, blackish-brown with green or yellow stripes and spots.

♂. All the wings with an ochre-brown basal spot, occupying the costal, subcostal, and median areas out to the first antenodal. Tooth of the tarsal nails less than half as long as the tip of the nail itself on both nails of the first leg and on the inner (or posterior) nail of the second and of the third leg; as long as the tip of the nail itself on the outer (anterior) nail of the second and third legs. Superior appendages with the apex acute.

♀. The ochre-brown basal spot on front wing reaching to the second antenodal; a second basal streak in the cubital area to the cross-vein, occupying also some of the anal area at base. The hind wings also with two ochre-brown basal streaks in the same areas, the first reaching to the upper end of the arculus, the second to the second (or distal) cubito-anal cross-vein and posteriorly to the apex of the membranule; these two basal streaks are fused at base, but separate, distal to the level of the first cubito-anal cross-vein in the median area. Tooth of the nails less than half as long as the tip of the nail itself on both nails of all the legs.

Dimensions: Abdomen ♂ 26.5, ♀ 23; hind wing ♂ 23.5–24, ♀ 24.5 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 1 ♂ and parts of 6 others; 2 ♀ and part of 1 other, no. 100. Carnegie Museum, Pittsburgh.

The sexual difference in the tarsal nails is interesting, and furnishes a transition from the condition found in the more typical species of *Brechmorhoga*, or of *Dythemis*, to that observed in *Macrothemis*. On comparing the tarsal nails of the same leg, it is evident that the outer nail of the second and third legs is distinctly shorter than the inner nail, the length of both nails being subequal to the tip of the tooth; the shorter length of the outer nail is due to a shortening of the tip of the nail itself.

Genus MACROTHEMIS.

§ I. Hind wings of ♀ with only one row of posttriangular cells. (♂ unknown.)

190. **Macrothemis uniseries** sp. nov.

♀. Wings with a basal brown streak in the subcostal area reaching half-way to the first antenodal on the front wings, two-thirds-way to the first antenodal on the hind wings, on which latter the brown overflows a little at the extreme base into the costal and median areas; cubital area of hind wings from base to cross-vein a little less deeply brown than the streak just described; first two anal cells bordering the anal vein distal to membranule yellow.

Pale green antehumeral stripes faded, apparently similar to those of *musiva* [*i. e.* T-shaped]; sides of thorax pale green; a dark brown stripe on the obsolete first lateral thoracic suture to a short distance above the metastigma, where it enlarges into a rounded spot; a narrower dark brown stripe on the second lateral thoracic suture for its entire length, narrowing upward.

Abdomen 30, hind wing 27 mm.

♂ unknown.

Habitat: — BRAZIL, Rio Grande do Sul, by H. H. Smith, 1 ♀. Carnegie Museum, Pittsburgh.

Different from other females of *Macrothemis*, except *M. pumila*, by the single posttriangular row of the hind wings. Different from *pumila* by its larger size and the basal brown streaks of the wings.

§ II. Hind wings of the ♀ with two, of the ♂ with one posttriangular row.

191. **Macrothemis musiva** Calvert.

Macrothemis musiva Calv., Biol. Centr.-Amer. Neurop., p. 289. 1906.

Habitat: — COLOMBIA, Bonda, December, 1 ♂, and Onaca, December, 1 ♂.

BRAZIL, Rio de Janeiro, 1 ♂; Chapada, 1 ♂.

The preceding by H. H. Smith. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, January, 1900, by W. T. Foster, 3 ♀. U. S. National Museum.

192. **Macrothemis capitata** sp. nov.

♂. Falls under the rubrics A and B of the synopsis of this genus in Biol. Centr.-Amer. Neurop. p. 288, except that the pale green antehumeral stripes are capitate, not T-shaped.

Most, but not all, of the metallic-blue area of the frons occupied by two pale green spots, separated from each other by a black line wider above. Vertex blackish.

Abdomen 26, hind wing 25–26 mm.

♀ uncertain.

Habitat: — BRAZIL, Desterro, December, by H. H. Smith, 2 ♂. Carnegie Museum, Pittsburgh.

This species is near to *M. tenuis* Hagen, but is smaller, and has only one cubito-anal cross-vein on the hind wings.

193. **Macrothemis imitans** Karsch.

Macrothemis imitans Calvert, Proc. Bost. Soc. Nat. Hist. xxviii, pp. 319, 329, pls. i, ii. 1898.

VENEZUELA, 4 ♂, 2 ♀. U. S. National Museum.

BRAZIL, Chapada, by H. H. Smith, 2 ♂, 1 ♀, no. 121. Carnegie Museum, Pittsburgh.

194. **Macrothemis pseudimitans** Calvert.

Macrothemis pseudimitans Calvert, Biol. Centr.-Amer. Neurop. pp. 290, 406. 1906, 1908.

Habitat: — BRAZIL, Muniz Freire in Espiritu Santo, June 18, 1908, by J. D. Haseman, 1 ♂, 1 ♀.

Rio de Janeiro, 1 ♂, and Chapada, May, 1 ♂ and parts of 2 others, by H. H. Smith.

All in the Carnegie Museum, Pittsburgh.

All these are smaller than the dimensions given in the work cited, and measure abdomen ♂ 23.5–25, ♀ 22; hind wing ♂ 25–28, ♀ 28 mm.

195. **Macrothemis hemichlora** Burmeister.

Macrothemis hemichlora Calvert, Biol. Centr.-Amer. Neurop. pp. 290, 406. 1906, 1908.

Habitat: — COLOMBIA, Bonda in August, 1 ♀.

BRAZIL, Rio de Janeiro in November, 2 ♀; Chapada, 3 ♀. All six by H. H. Smith.

Sete Lagoas in Minas Geraes, May, 1908, by J. D. Haseman, 1 ♀.

All in the Carnegie Museum, Pittsburgh.

196. **Macrothemis flavescens?** Kirby.

Miathyria flavescens? Kirby, Ann. Mag. Nat. Hist. (6) xix, p. 600, pl. xiii, fig. 2. 1897.

Macrothemis flavescens? Calv., Proc. Bost. Soc. Nat. Hist. xxviii, p. 328. 1898.

♂. Falls under rubrics A (except that the apices of the superior appendages are not acute), BB (except that the hind wings have two rows between A_3 and the anal angle, superior appendages with no tooth or denticles) and CC (except that the inferior appendage has its tip only one-fourth as wide as base and only slightly notched) of the synopsis of species in Biol. Centr.-Amer. Neurop. p. 288.

Abdomen 22.5–23, hind wing 24.5–25 mm.

Habitat: — BRAZIL, River Cuyabá, January 23, 1886, 1 ♂; Cachoeira Cuyabá, open place near river, January 25, 1 ♂, both by H. H. Smith. Carnegie Museum, Pittsburgh.

197. **Macrothemis declivata** sp. nov.

(PLATE VII, FIGS. 137, 138.)

Falls under rubrics A and BB (except that the hind wings of the ♂ have 4–5 rows of cells between A_3 and the anal angle, and the inferior denticles of the superior appendages are on the third fourth) of the synopsis of species in Biol. Centr.-Amer. Neurop. p. 288. The green antehumeral stripes are 2.5 mm. long, narrow gradually forward (downward) and stop at about .5 mm. from the inferior transverse mesepisternal carina. Sides of the thorax pale green, with two complete blackish stripes at the first and second lateral sutures respectively.

♂. Differs from all other species in having the apex of the superior appendages a little produced and curved ventrad and laterad. Abdominal segment 8 at base 3 mm. wide.

♀. Wings yellowish from base to nodus for entire (front) or almost the entire (hind) width. One ♀ has only one posttriangular row on both hind wings for three cells, but the other two have two rows.

Dimensions: — Abdomen ♂ 29.5, ♀ 29; hind wing ♂ circa 33, ♀ 34–35 mm.

Habitat: — BRAZIL, Rio de Janeiro, by H. H. Smith, 1 ♂, 3 ♀, some dated November. Carnegie Museum, Pittsburgh.

198. **Macrothemis marmorata** Hagen.

Macrothemis marmorata Calvert, Proc. Bost. Soc. Nat. Hist. xxviii, pp. 318, 323, pl. ii, fig. 33. 1898.

Habitat: — BRAZIL, Rio Grande de Sul, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

199. **Macrothemis griseofrons** sp. nov.

♂. Falls under rubric AA of the synopsis of species, Biol. Centr.-Amer. Neurop. p. 289, except as follows: thorax and most of the abdomen pruinose, 8–10 and the appendages brown, the superior appendages acute at tip.

Frons and vertex pale bluish-gray, nasus and rhinarium luteous, labrum orange. Hamule most prominent of the genitalia of abd. seg. 2, anterior lamina more prominent than the genital lobe, entire. Hind wings ochraceous in part of the anal area, beginning at the anal vein and extending back 4 mm. and from the membranule distad to two cells immediately bordering the anal vein, centres of the cells a little paler.

Abdomen 27.5, hind wing 30 mm.

♀ unknown.

Habitat: — BRAZIL, Bom Fim in Bahia, November 20, 1907, by J. D. Haseman at the Fazenda de Amaratu, 1 ♂. Carnegie Museum, Pittsburgh.

200. **Macrothemis lutea** sp. nov.

♂. Abdomen very long and slender, not widened on 7–8, luteous, with the sutures, carinæ, and (on 4–9) on each side of dorsum a narrow stripe, black. Thorax pale olive-green with black lines on parts of the lateral sutures. Hind wings with one posttriangular row, three rows between and parallel to A_3 and the anal angle. 2 cells between the hind angle of the triangle and the point of origin of A_2, 1 cell between the hind angle of the triangle and A_2 immediately opposite that angle. Superior appendages not acute at the extreme tip, with an inferior tooth at three-fourths' length.

Abdomen 40.5, hind wing 34.5 mm.

♀ unknown.

Habitat: — BRAZIL, Propria in Sergipe, March 31, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

GYNOTHEMIS[36] gen nov.

Falling in the synopsis of Mexican and Central American genera of Libellulinæ (in Biol. Centr.-Amer. Neurop. p. 202), under the same rubric as *Paltothemis*, but differing therefrom as follows: area between the anal angle of the hind wings and A_3 with the cells not arranged as described for *Paltothemis*, nor in rows parallel to the anal angle or to A_3, but more irregularly; only one row of cells between R_5 and the supplementary sector next below, M_2 not waved; front wings with the discoidal triangle free and two posttriangular rows from triangle to wing-margin; femora in both sexes armed with the usual two rows of spines as in most Libellulinæ, those of the male not differentiated as they are in *Macrothemis*, *Brechmorhoga*, etc.

Type: *Gynothemis venipunctata* sp. nov.

201. **Gynothemis venipunctata** sp. nov.

(PLATE IX, FIG. 146.)

Wings ochraceous at base, on the front pair for their entire width out to the distal angle of the triangle, on the hind pair from the anterior margin to within two cells of the hind margin and out to two or three cells distad of the triangle. Antenodals in the subcostal spaces and the cubito-anal cross-vein on all the wings, and the angles of the triangle and a few cross-veins distal to the triangle on the hind wings, dotted with brown.

♂. Frons anteriorly and superiorly (but not laterally) and the vertex dark metallic-blue; lips mostly blackish; thorax dark brown, sides paler, obscure; abdomen pale yellowish, a mid-dorsal and a lateral brown or black longitudinal stripe, the laterals beginning at the hind end of segment 3.

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[36] This proposed name refers to the fact that the genus, although similar in many ways to *Macrothemis*, differs, among others, in that the male femora are armed like those of female *Macrothemis*.

Superior appendages slender, convex in profile, a small inferior tooth at five-sixths' length, where the tapering to the acute apex begins. Inferior appendage nine-tenths as long as the superiors. Genitalia of the second abdominal segment similar to those of *Macrothemis musiva*, but the hamule still more slender.

Legs yellow, brownish below.

♀. Frons and vertex greenish, lips chiefly greenish, with some dark marks; thorax greenish-yellow, with a mid-dorsal dark brown band. Vulvar lamina not quite reaching the hind margin of 8, emarginate.

Dimensions: Abdomen ♂ 16.5, ♀ 15.5; hind wing ♂♀ 20 mm.

Habitat: — BRAZIL, Chapada, by H. H. Smith, 3 ♂ and parts of 15 others; parts of 4 ♀, nos. 131 and 66; Rio Sapon, January 30, 1908, by J. D. Haseman, 1 ♀. Carnegie Museum, Pittsburgh.

202. **Miathyria marcella** Selys.

Miathyria marcella, Calvert, Biol. Centr.-Amer. Neurop., pp. 294, 407. 1906, 1908.

Habitat: — COLOMBIA, Bonda, 2 ♀. H. H. Smith.

BRAZIL, Barreiras, January 4, 1908, 1 ♀, and Campo Largo, December 31, 1907, in Bahia, by J. D. Haseman.

Chapada, 17 ♂, 5 ♀; Cachoeira, 1 spmn. broken. Corumbá, May, 1 ♂, 1 ♀; Rio Grande do Sul, 1 ♂, 1 ♀; by H. H. Smith.

All the preceding in the Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, by W. T. Foster, November, 1899, January and March, 1903, 9 ♂, 9 ♀. U. S. National Museum.

Concepcion, December 31, 1 broken spmn.

ARGENTINA, Goya, Rio Paraná, east side, December 22, 1 ♂, 3 ♀.

? Fazenda de San Jose, Bananol, Grande Channel, near San Lourenso, January 8, 1 ♀.

The last six specimens by H. H. Smith, Carnegie Museum, Pittsburgh.

203. **Miathyria simplex** Rambur.

Miathyria simplex Calv., Biol. Centr.-Amer. Neurop., p. 295. 1906.

Habitat: — BRAZIL, Corumbá, April, by H. H. Smith, 1 ♀. Carnegie Museum, Pittsburgh.

204. **Tauriphila risi** Martin.

Tauriphila risi Martin, Boll. Mus. Zoöl. Torino, no. 239, p. 1. 1896.
Ris, Hamburg. Magal. Sammelr. Odon., p. 32. 1904.

Habitat: — BRAZIL, Rio Grande do Sul by H. v. Ihering, 3 ♂, 1 ♀. Academy of Natural Sciences of Philadelphia.

Same locality, 2 ♂, 1 ♀, by H. H. Smith.

PARAGUAY, Rio Parana [? Paraguay] above Rosario, December 19, in cop. 1 ♂, 1 ♀, by H. H. Smith.

Sapucay, December, 1899, by W. T. Foster, 5 ♀. U. S. National Museum.

ARGENTINA, Goya, Rio Parana, east side, December 22, by H. H. Smith, 4 ♂, 3 ♀.

The specimens collected by H. H. Smith, are in the Carnegie Museum, Pittsburgh.

205. **Tauriphila australis** Hagen.

Tauriphila australis Calvert, Biol. Centr.-Amer. Neurop., p. 297, pl. ix, figs. 46, 47. 1906.

Habitat: — COLOMBIA, Bonda, November, 1 ♀, December, 1 ♂, by H. H. Smith. Carnegie Museum, Pittsburgh.

206. **Tauriphila argo** Hagen.

Tauriphila argo Calv., Biol. Centr.-Amer. Neurop., p. 299, pl. ix, figs. 48, 49, 1906.

Habitat: — BOLIVIA, Piedra Blanca, April, 1 ♂.

PARAGUAY, Sapucay, November, 1899, 1 ♂, 4 ♀, December, 1 ♀, by W. T. Foster. U. S. National Museum.

ARGENTINA, Rio Parana just below Corrientes, December 23, 1 ♂. This and the Bolivian specimen by H. H. Smith, Carnegie Museum, Pittsburgh.

Genus TRAMEA.

The first four forms have been separated as follows, without presuming to decide whether all are entitled to specific rank. These four fall under Section I of the Synopsis in Biologia Centrali Americana, Neurop., p. 300. Abdominal segments 8 + 9 + 10 measure 5–5.5 mm. long, the inferior appendage of the males 1.5 mm. in all (four?).

Dark (blackish-brown) basal coloring of the hind wings reaching back not quite to the hind margin, but 8.5–10 mm. behind the cubital vein, with no clearer area between this band and the proximal (or anal) wing-margin. Superior appendages ♂ 5 mm. long. Hamule recumbent on genital lobe, projecting beyond it by less than the vertical half of the latter. Frons ♂ superiorly metallic-violet. *brasiliana.*

Dark brown basal coloring of hind wing reaching back not quite to the hind margin, 10–11 mm. behind Cu, with a clearer area between it and the proximal wing-margin. Superior appendages ♂ 3.5 mm. Hamule projecting beyond the genital lobe by less than half the vertical height of the lobes. Frons ♂ superiorly metallic-violet. . . . . *longicauda*, var.

Dark brown basal coloring of the hind wings reaching back to more than half the width of the wing, 7 mm. behind Cu, with a clear area between at least its hind half and the proximal wing-margin. Superior appendages ♂ ?, ♀ 3.5 mm. Hamule as in *brasiliana*. Frons ♂ superior metallic-violet, ♂ yellow with basal superior metallic-blue stripe, 7 mm. wide. . . . . *binotata*.

Dark brown basal coloring of hind wing reaching back to half the width of the wing, 5 mm. behind Cu, with a clearer area between it and the proximal wing-margin. Appendages ♀ 3.5 mm. Vulvar lamina reaching to seven-eighths, or to the hind end, of the lateral margin of segment 9. Frons ♀ yellow or greenish yellow, a superior basal metallic-blue stripe .5 mm. wide. . . . . *subbinotata*.

207. **Tramea brasiliana** Brauer.

Habitat:—BRAZIL, Minas Geraes 1 ♂, Museum, of Comparative Zoölogy, Cambridge, Mass.

Sete Lagoas in Minas Geraes, May 3, 1908, by J. D. Haseman, 1 ♂.

Chapada?, by H. H. Smith, 2 ♂, no. 38. Carnegie Museum, Pittsburgh.

208. **Tramea longicauda** Brauer var.?

Habitat:—BRAZIL, Sete Lagoas in Minas Geraes, May 7, 1908, by J. D. Haseman, 1 ♂.

Rio Grande do Sul, 2 ♂; Cuyabá, 1 ♂; Corumbá, May, 2 ♂.

BOLIVIA, Piedra Blanca, April, 1 ♂.

The six specimens by H. H. Smith. Carnegie Museum, Pittsburgh.

209. **Tramea binotata** Rambur.

Two males in the Museum of Comparative Zoölogy, Cambridge, Mass., without locality labels, one of them labeled "L. binotata" in de Selys' hand, and "Cl" [= ? Claussen and hence Minas Geraes?].

PARAGUAY, Sapucay, by W. T. Foster, March 9, 1903, 1 ♀. U. S. National Museum.

210. **Tramea subbinotata** Brauer.

Habitat:—BRAZIL, 1 ♀ by Heyer, Museum of Comparative Zoölogy, Mass.

ARGENTINA, Goya, Rio Paraná, east side, December 22, by H. H. Smith, 1 ♀. Carnegie Museum, Pittsburgh.

211. **Tramea cophysa ?** Hagen.

Tramea cophysa ? Calvert, Biol. Centr.-Amer. Neurop., p. 301. 1906.

Habitat:—COLOMBIA, Bonda, July, 1 ♂, 7 ♀, August, 3 ♂, 7 ♀, October, 2 ♀, November, 2 ♀.

BRAZIL, Chapada, 7 ♂, 3 ♀, no. 130.

All by H. H. Smith. Carnegie Museum, Pittsburgh.

212. **Tramea insularis** Hagen.

Tramea insularis, Calvert, Biol. Centr.-Amer. Neurop., p. 303. 1906.

Habitat:—BAHAMAS, Andros Island, Mangrove Cay, July 31, 1904, by O. Bryant, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

213. **Tramea onusta** Hagen.

Tramea onusta Calvert, Biol. Centr.-Amer. Neurop., p. 305. 1906.

Habitat:—BAHAMAS, Andros Island, Mangrove Cay, August, 1904, by Allen, Barbour, and Bryant, 1 ♂. Museum of Comparative Zoölogy, Cambridge, Mass.

214. **Pantala flavescens** Fabr.

Pantala flavescens Calv., Biol. Centr.-Amer. Neurop. pp. 307, 407. 1906, 1908.

Habitat:—COLOMBIA, Bonda, July, 3 ♂, 1 ♀; August, 4 ♂, 3 ♀, September, 1 ♂; Onaca, August, 1 ♀.

BRAZIL, Rio Grande do Sul, 1 ♀.

All by H. H. Smith. Carnegie Museum, Pittsburgh.

Saõ Paulo, September 7, 1900, by A. Hempel. Academy oi Natural Sciences of Phila.

BOLIVIA, near Coroico, June 4 and 6, 1899, by W. J. Gerhard, 2 ♂. Academy Natural Sciences of Philadelphia.

PARAGUAY, Sapucay, November, 1899, by W. T. Foster, 1 ♂. U. S. National Museum.

215. **Pantala hymenæa** Say.

Pantala hymenæa Calv., Biol. Centr.-Amer. Neurop. pp. 309, 407. 1907, 1908.

Habitat:—COLOMBIA, Bonda, by H. H. Smith, 1 ♂.

BRAZIL, Barreiras in Bahia, January 4, 1908, by J. D. Haseman, 1 ♂. Carnegie Museum, Pittsburgh.

216. **Diastatops pullata** Burmeister.

Habitat:—BRAZIL, Cachoeira, 1 ♂, no. 29; Cachoeira Cuyabá Lagoa, January 29, 1 ♂; both by H. H. Smith. Carnegie Museum, Pittsburgh.

217. **Diastatops fuliginea** Rambur.

Habitat:—BRAZIL, Boqueiraõ in Bahia, near the junction of Rio Preto and Rio Grande, January 7, 1908, by J. D. Haseman, 1 ♂, 1 ♀. Carnegie Museum, Pittsburgh.

218. **Diastatops tincta** Rambur.

Habitat: — BRAZIL, Uacaryzal, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

219. **Perithemis thais** Kirby.

Habitat: — PERU, Iquitos, Staudinger, 2 ♂.

BRAZIL, Para? 1 ♂.

Museum of Comparative Zoölogy, Cambridge, Mass.

PARAGUAY, Sapucay, March, 1900, by W. T. Foster, 2 ♂. U. S. National Museum.

220. **Perithemis domitia iris** Hagen.

Perithemis domitia iris Calvert, Biol. Centr.-Amer. Neurop., p. 313, 408. 1907 1908.

Habitat: — COLOMBIA, Bonda, August, 1 ♂, by H. H. Smith, Carnegie Museum, Pittsburgh.

PARAGUAY: Sapucay, November, 1899, 1 ♂, January, 1903, 8 ♂, February, 1900, 1 ♀, by W. T. Foster. U. S. National Museum.

221. **Perithemis domitia mooma** Kirby.

Perithemis domitia mooma, Calv., *l. c.*, p. 314. 1907.

Habitat: — VENEZUELA, La Guaira, July 27, 1900, by Lyon & Robinson, 1 ♂. U. S. National Museum.

BRAZIL, Barreiras, January 4, 1 ♀, and Campo Largo, January 1, 1908, 1 ♀, in Bahia, by J. D. Haseman. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, March, 1900, by W. T. Foster, 1 ♀. U. S. National Museum.

222. **Rhodopygia hollandi** Calvert.

(PLATE IX, FIG. 148.)

Rhodopygia hollandi Calvert, Biol. Centr.-Amer. Neurop., pp. 319, pl. ix, fig. 54. 1907.

Habitat: — BRAZIL, Chapada, 7 ♂, 4 ♀ (parts); Cachoeira, 1 ♂, no. 40; Cuyabá, January, 1886, lakes, 3 ♂, 1 ♀; by H. H. Smith. Carnegie Museum, Pittsburgh.

223. **Cannacria furcata** Hagen.

Cannacria furcata Calv., *l. c.*, p. 325. 1907.

Habitat: — BRAZIL, Sete Lagoas in Minas Geraes, May 8, 1908, by J. D. Haseman, 1 ♂.

Rio de Janeiro, November, 1 ♀, January, 2 ♂, 3 ♀.

ARGENTINA, Santa Helena, December 21, 1 ♀, and Goya, December 22, 1 ♀, both east side Rio Paraná.

H. H. Smith. Carnegie Museum, Pittsburgh.

224. **Cannacria batesi** Kirby.

Cannacria batesi Calv., *l. c.*, p. 326. 1907.

Habitat: — BRAZIL, Campo Largo in Bahia, January 1, 1908, by J. D. Haseman, 1 ♂, 1 ♀.

Chapada, December, 1 ♂, 1 ♀.

BOLIVIA, Piedra Blanca, April, 1 ♂.

The last three by H. H. Smith. All in the Carnegie Museum, Pittsburgh.

225. **Erythemis peruviana** Rambur.

Erythemis peruviana Calv., *l. c.*, p. 333. 1907.

Habitat: — COLOMBIA, Bonda, October, 1 ♂, by H. H. Smith.

BRAZIL, Barreiras in Bahia, January 4, 1908, by J. D. Haseman, 3 ♂, 1 ♀.

Cuyabá, January, 1886, lakes, 3 ♂, 1 ♀; Cachoeira, 1 ♂, 1 ♀; Uacaryzal, February, 1 ♂, 1 ♀, by H. H. Smith.

Santa Anna do Japara, August 20, by Moenkhaus, 1 ♀. Collection of C. C. Adams.

PARAGUAY, Rio Paraguay, below Concepcion, "December 28, clay beach fronting lowland forest, very abundant," 1 ♂, 1 ♀, December 31, 1 ♂, by H. H. Smith.

The preceding, except that from Santa Anna, etc., in the Carnegie Museum, Pittsburgh.

Sapucay, December, 1899, and January, 1900, by W. T. Foster, 2 ♀. U. S. National Museum.

226. **Erythemis mithroides** Brauer.

Erythemis mithroides Calv., *l. c.*, p. 334. 1907.

Habitat: — PARAGUAY, Concepcion, December 31, by H. H. Smith, 2 ♂. Carnegie Museum, Pittsburgh.

227. **Erythemis attala** Selys.

Erythemis attala Calv., *l. c.*, p. 335. 1907.

Habitat: — BRAZIL, Santa Anna do Japara, August, 1898, by Moenkhaus, 3 ♂, 1 ♀. Collection of C. C. Adams.

Cachoeira Cuyaba, January 27, by H. H. Smith, 1 ♂. Carnegie Museum, Pittsburgh.

PARAGUAY, Sapucay, January, 1900, by W. T. Foster, 1 ♂. U. . National Museum.

228. **Erythemis verbenata** Hagen.

Erythemis verbenata Calv., *l. c.*, p. 336. 1907.

Habitat: — COLOMBIA, Bonda, October, 1 ♂, November, 3 ♂, 1 ♀, December, 1 ♂, by H. H. Smith.

BRAZIL, Bosqueiraõ in Bahia, January 7, 1908, by J. D. Haseman, 1 ♂.

Rio Janeiro, November, 1 ♀, January, 1 ♂; Corumbá, May, 3 ♀; Uacaryzal, 1 ♀; by H. H. Smith.

PARAGUAY, below Asuncion, December 24, 1 ♂, by H. H. Smith.

All the preceding in the Carnegie Museum, Pittsburgh.

Sapucay, March, 1900, by W. T. Foster, 1 ♂. U. S. National Museum.

229. **Erythemis hæmatogastra** Burmeister.

(PLATE IX, FIG. 154.)

Erythemis hæmatogastra Calv., *l. c.*, p. 338. 1907.

Habitat: — BRAZIL, Rio Grande above the mouth of Rio Preto in Bahia, December 30, 1907, by J. D. Haseman, 1 ♀.

Cachoeira Cuyabá, January 27, 1 ♂; Cuyabá, 1 ♂; Uacaryzal, February, 1 ♂; by H. H. Smith.

PARAGUAY, Rio Paraguay beyond Concepcion, forest shore, December 28, 1 ♀, by H. H. Smith. Carnegie Museum, Pittsburgh.

230. **Erythemis credula** Hagen.

Erythemis credula Calv., *l. c.*, p. 339. 1907.

Habitat: — BRAZIL, Cuyabá, 1 ♀; Cachoeira, 1 ♂, 1 ♀; Uacaryzal, 2 ♂, 2 ♀; Corumbá, April, 1 ♂.

BOLIVIA, Piedra Blanca, April, 1 ♂.

All by H. H. Smith. Carnegie Museum, Pittsburgh.

231. **Lepthemis vesiculosa** Fabricius.

Lepthemis vesiculosa Calv., *l. c.*, p. 339. 1907.

Habitat: — COLOMBIA, Bonda, August, 2 ♂, 1 ♀, October, 2 ♂, November, 2 ♀, by H. H. Smith.

BRAZIL, Campo Largo in Bahia, December 31, 1907, by J. D. Haseman, 2 ♂.

Chapada, December, by H. H. Smith, 1 ♂.

The preceding in the Carnegie Museum, Pittsburgh.

Santa Anna do Japara, August, 1898, by Moenkhaus, 1 ♀. Collection of C. C. Adams.

PARAGUAY, Sapucay, by W. T. Foster, February and March, 1900, by W. T. Foster, 2 ♂. U. S. National Museum.

EXPLANATION OF PLATES.

(All the figures on Plates 1–7 have been drawn with the aid of the drawing camera by the author. Figs. 1–4, 17–43 are on the same scale; 6–16 are on the same scale; 44–124 are on the same scale; 125–127 are on the same scale; 128, 129, 131–133 are on the same scale; 130, 134–138 are on the same scale.)

PLATE I.

FIGS. 1, 2. *Hetærina fuscibasis*, sp. nov., ♂. Chapada, abdominal appendages. 1, supero-internal-oblique view, left appendages. 2, profile view of the same.

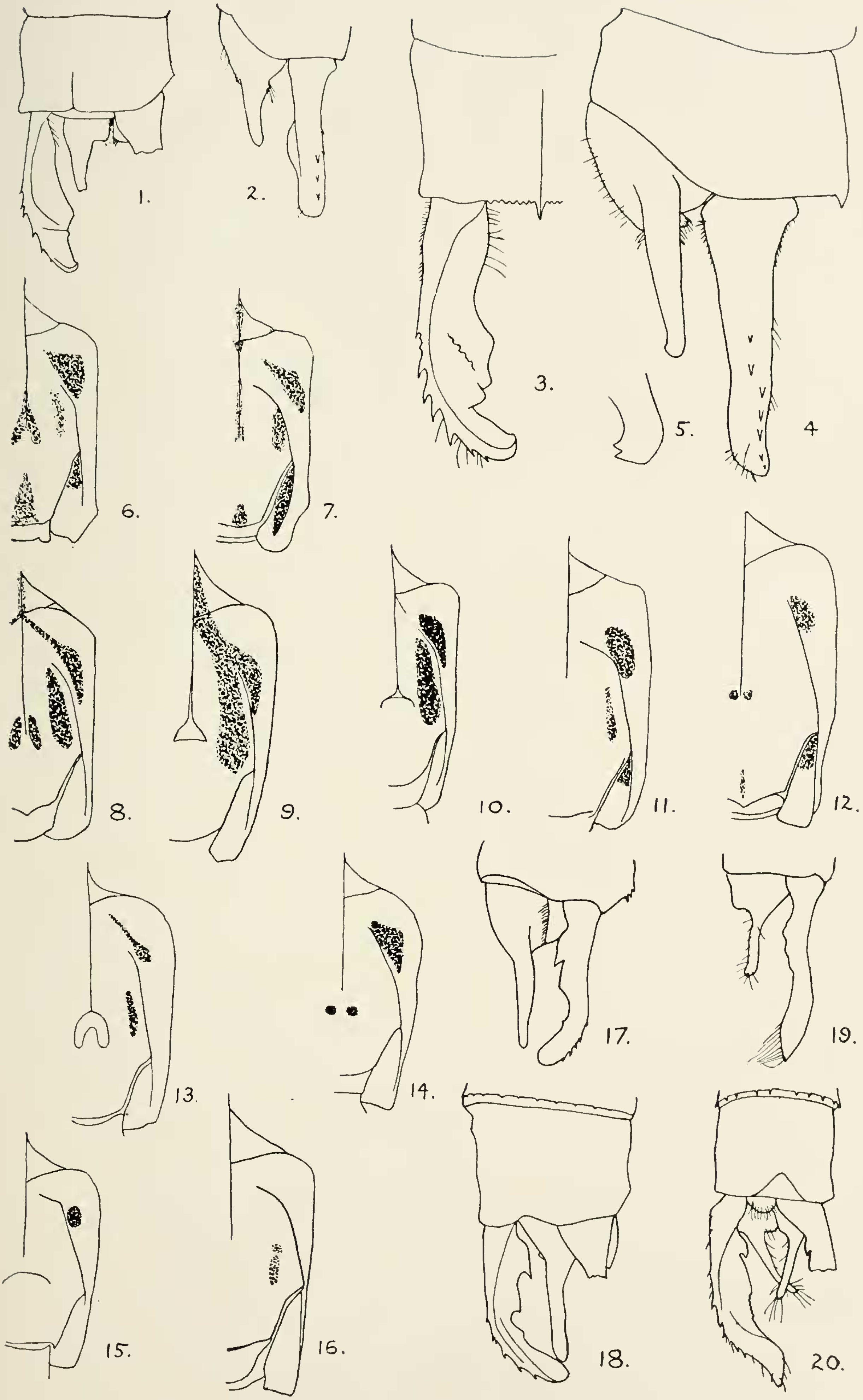
FIGS. 3, 4, 5. *Hetærina charca*, sp. nov., ♂. Chulumani, Bolivia, Nov. 30, 1898. 3, left superior abdominal appendage, dorsal view. 4, profile view, left appendages. 5, inner ventral view, apex of left inferior appendage.

FIGS. 6–16. Pectoral color-patterns of species of *Lestes*; the left side only is shown.

6. *Lestes scalaris*, sp. nov., ♂, Cuba.
7. *Lestes spumarius*, Selys, ♂, Cuba.
8. *Lestes dichrostigma*, sp. nov., ♂, Saõ Paulo.
9. *Lestes tricolor* Erichson, ♂, Bahia?
10. *Lestes mediorufus*, sp. nov., ♂, Saõ Paulo.
11. *Lestes pictus* Hagen, ♂, Brazil.
12. *Lestes tenuatus* Rambur, ♂, Don Diego, Colombia.
13. *Lestes quadristriatus*, sp. nov., ♂, Chapada.
14. *Lestes paulistus*, sp. nov., ♂, Saõ Paulo.
15. *Lestes bipupillatus* sp. nov., ♀, Chapada.
16. *Lestes undulatus* Say, ♂, Penco, Chile.

FIGS. 17, 18. *Lestes scalaris*, sp. nov., ♂, Cuba, by Gundlach, 1866. 17, profile view left abdominal appendages; 18, supero-internal oblique view of the same.

FIGS. 19, 20. *Lestes spumarius* Selys, ♂, Cuba. 19, profile view, left abdominal appendages; 20, supero-internal oblique view of the same.



Hetærina and Lestes.

PLATE II.

FIGS. 21, 22. *Lestes bipupillatus*, sp. nov., ♂, Chapada, Brazil. 21, profile view, left appendages; 22, supero-internal oblique view of the same.

FIGS. 23, 24. *Lestes mediorufus*, sp. nov., ♂, Saõ Paulo, September 14, 1900. 23, profile view, left appendages; 24, supero-internal oblique view of the same.

FIGS. 25, 26. *Lestes paulistus*, sp. nov., ♂, Saõ Paulo, September 14, 1900. 25, profile view, left abdominal appendages; 26, dorsal view of appendages.

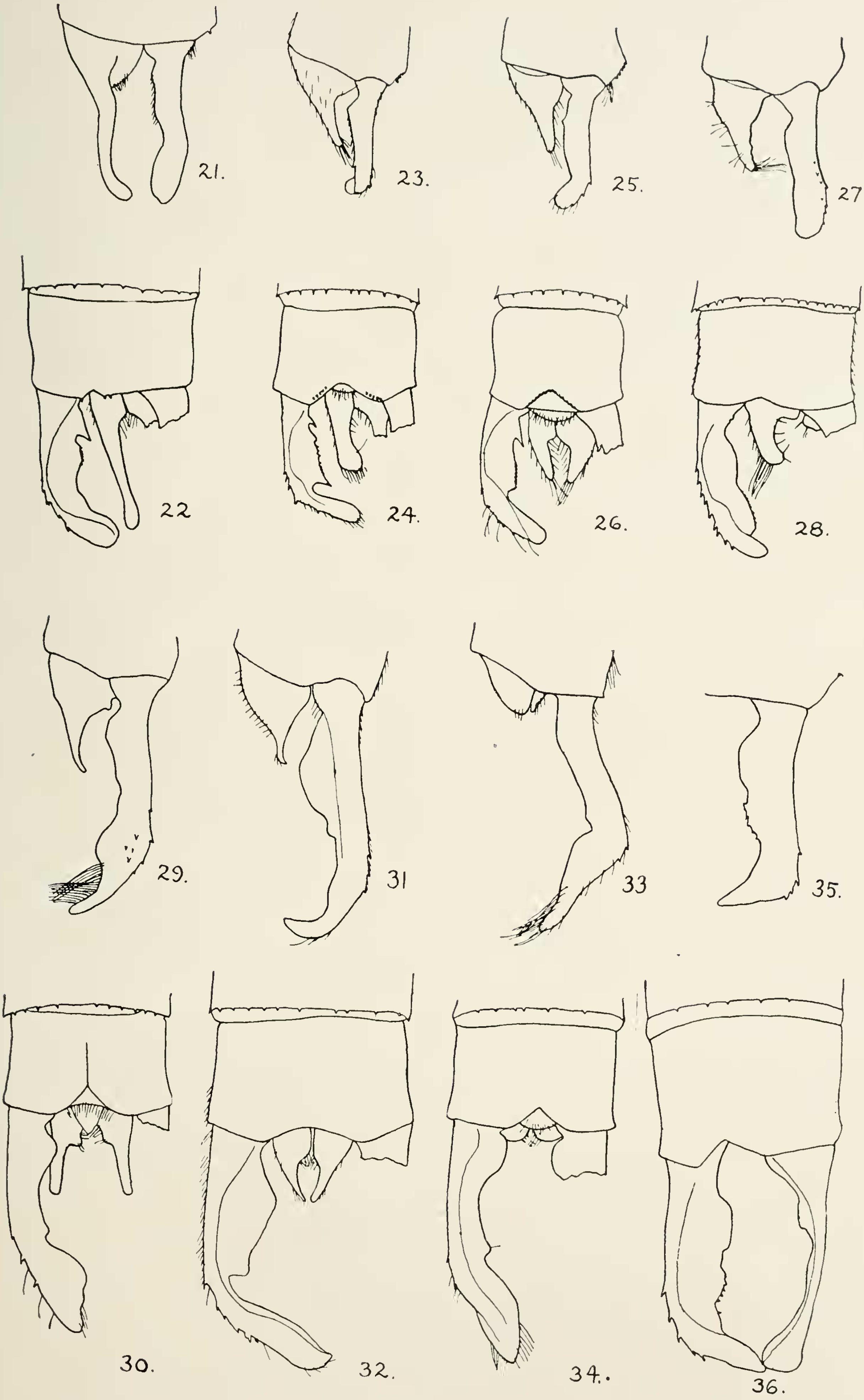
FIGS. 27, 28. *Lestes pictus* Hagen, ♂, type, Brazil, by Fischer. 27, profile view, left appendages; 28, supero-internal oblique view of same.

FIGS. 29, 30. *Lestes tricolor* Erichson, ♂, type, Bahia. 29, profile view, left appendages; 30, dorsal view of appendages.

FIGS. 31, 32. *Lestes dichrostigma*, sp. nov., ♂, Saõ Paulo, September 14, 1900. 31, profile view, left appendages; 32, dorsal view of appendages.

FIGS. 33, 34. *Lestes undulatus* Say, ♂, Penco, Chile, January, 1905. 33, profile view, left appendages; 34, dorsal view of appendages.

FIGS. 35, 36. *Lestes quadristriatus*, sp. nov., ♂, Chapada, Brazil. 35, profile view, left superior appendage; 36, supero-oblique view, superior appendages from the right.



Lestes.

PLATE III.

FIGS. 37–42. Supero-internal oblique views of the right abdominal appendages of males of species of *Heteragrion*.

37. *Heteragrion æquatoriale* Selys, ♂, Piches and Perene valleys, Peru.

38. *Heteragrion inca*, sp. nov., ♂, Iquitos, Peru.

39. *Heteragrion triangulare* Hagen, ♂, Chapada, Brazil.

40. *Heteragrion aurantiacum* Selys, ♂, Rio de Janeiro.

41. *Heteragrion flavidorsum*, sp. nov., ♂, nine miles from Coroico, Bolivia, May 19, 1899.

42, 43. *Heteragrion angustipenne* Selys, ♂, Cumbase, Peru. 43, profile view, left appendages.

FIGS. 44, 45. *Perilestes fragilis?* Hagen, ♂, Chapada, Brazil. 44, supero-internal oblique view of right superior appendage; 45, internal view of same from slightly above.

FIG. 46. *Perilestes cornutus?* Selys, ♂, Surubres, Costa Rica, similar to fig. 45; damaged.

FIGS. 47, 48. *Oxyagrion divaricatum*, sp. nov., ♂, Chapada, Brazil. 47, dorsal, and 48, left profile view of abdominal appendages.

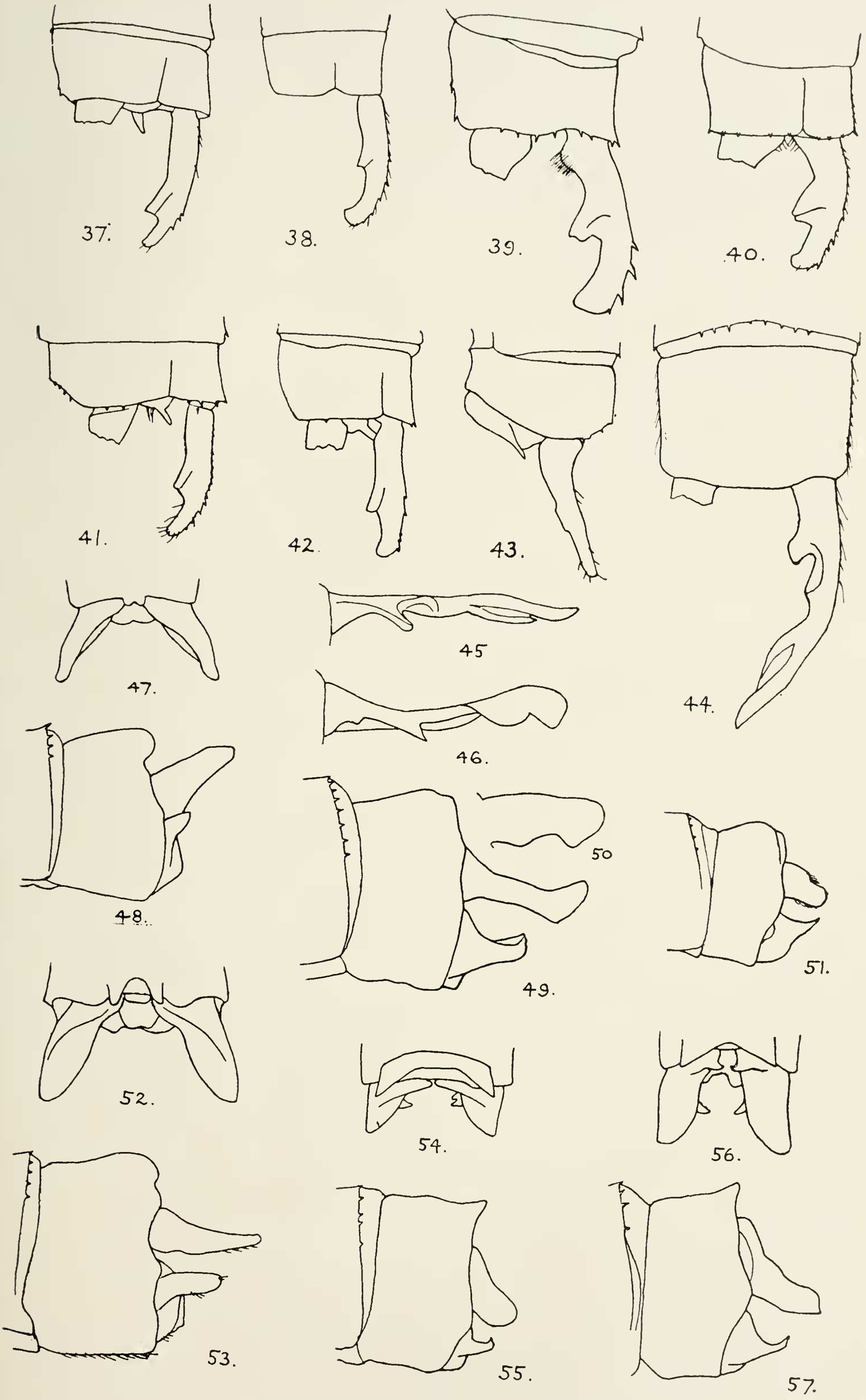
FIGS. 49, 50. *Oxyagrion rufulum* Hagen, ♂, Quillota, Chile. 49, left profile view of appendages; 50, supero-internal view, right superior appendage.

FIG. 51. *Oxyagrion evanescens*, sp. nov., ♂, Chapada, Brazil. Left profile view, abdominal apex.

FIGS. 52, 53. *Oxyagrion hempeli*, sp. nov., ♂, Saõ Paulo. 52, dorsal, and 53, left profile view of abdominal appendages.

FIGS. 54, 55. *Oxyagrion basale* Selys, ♂, Chapada, Brazil; similar to the preceding.

FIGS. 56, 57. *Oxyagrion impunctatum*, sp nov., ♂, Chapada, Brazil; similar to the preceding.



Heteragrion, Perilestes, and Oxyagrion.

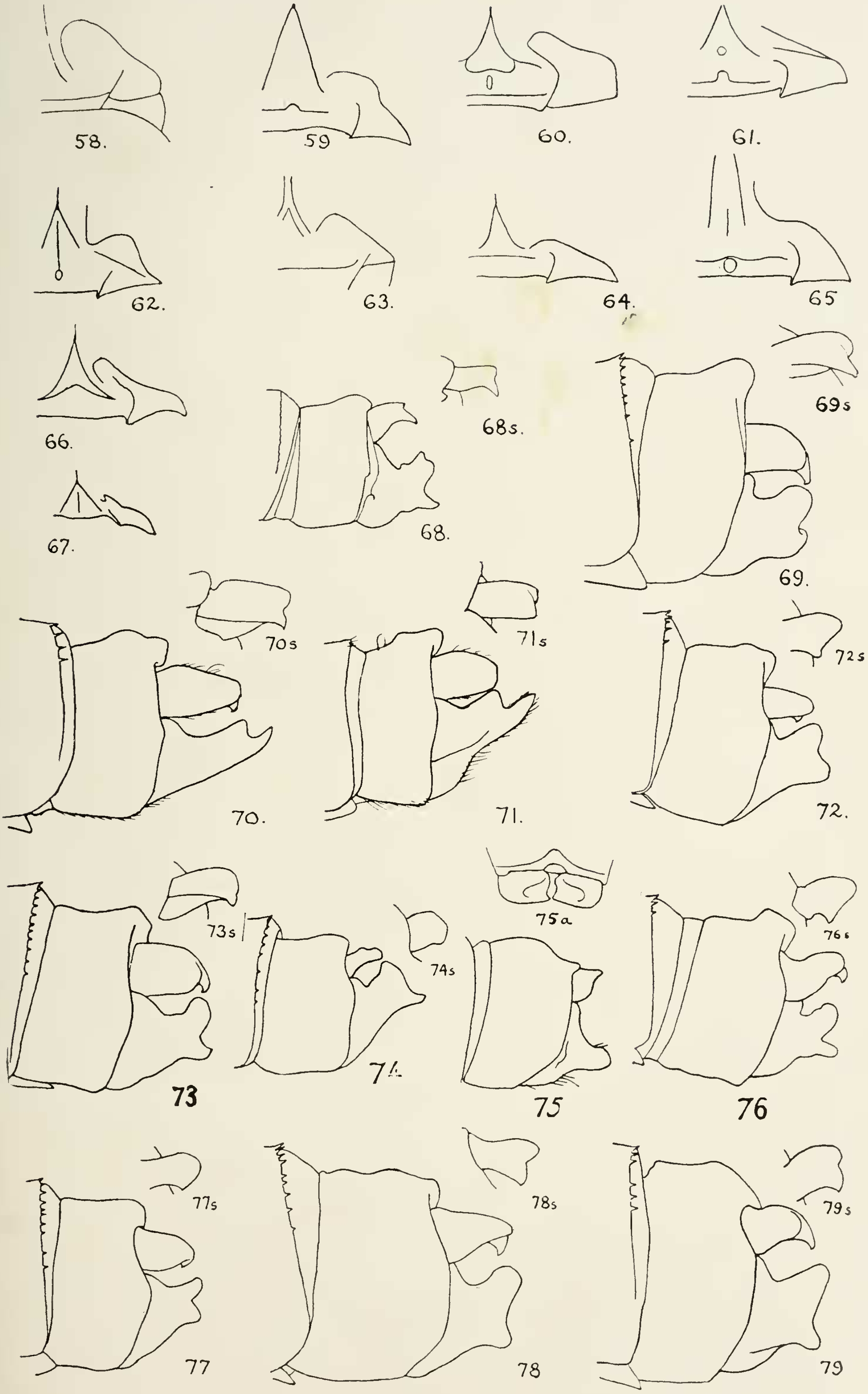
PLATE IV.

FIGS. 58–67. Left mesostigmal lamina of females of species of *Argia* and *Diargia*, viewed from in front.

58. *Argia fosteri*, sp. nov., ♀. Sapucay.
59. *Argia hasemani*, sp. nov., ♀, Bom Fim.
60. *Argia gerhardi*, sp. nov., ♀, Chulumani, Bolivia.
61. *Argia mollis* Hagen, ♀, Chapada.
62. *Argia tinctipennis* Selys, ♀, Peixe-Boi, Brazil.
63. *Argia botacudo*, sp. nov., ♀, Chapada.
64. *Argia smithiana*, sp. nov., ♀, Chapada.
65. *Argia iralai*, sp. nov., ♀, Sapucay.
66. *Argia reclusa* Selys, ♀, Chapada.
67. *Diargia bicellulata*, sp. nov., ♀, Chapada.

FIGS. 68–79. Left profile view of apex of abdomen of males of species of *Diargia* and *Argia;* 68*s*–79*s*, supero-internal oblique views of the right superior appendage of the same.

68, 68*s*. *Diargia bicellulata* sp. nov., ♂, Chapada.
69, 69*s*. *Argia fosteri*, sp. nov., ♂, Sapucay, November, 1899.
70, 70*s*. *Argia gerhardi*, sp. nov., ♂, Chulumani.
71, 71*s*. *Argia kokama*, sp. nov., ♂, Iquitos.
72, 72*s*. *Argia hasemani*, sp. nov., ♂, Bom Fim, Nov. 20, 1907.
73, 73*s*. *Argia tamoyo*, sp. nov., ♂, Chapada.
74, 74*s*. *Argia smithiana*, sp. nov., ♂ Chapada.
75. *Argia thisma*, sp. nov., ♂, Chapada. 75*a*, dorsal view of superior appendages of the same.
76, 76*s*. *Argia chapadæ*, sp. nov., ♂, Chapada.
77, 77*s*. *Argia botacudo*, sp. nov., ♂, Chapada.
78, 78*s*. *Argia tupi*, sp. nov., ♂, Chapada.
79, 79*s*. *Argia subapicalis*, sp. nov., ♂, Chapada.



Argia and Diargia.

PLATE V.

Fig. 80 *Acanthagrion gracile ablutum*, subsp. nov., ♂, near Coroico, May 2, 1899. Left profile view, apex of abdomen.

Fig. 81. *Acanthagrion gracile ascendens*, subsp. nov., ♂, Cachoeira, same. 81*a*, outline of upper part of abd. seg. 10, rear view.

Figs. 82, 82*a*. *Acanthagrion apicale*, Selys. ♂, Iquitos. As in the preceding.

Fig. 83. *Acanthagrion cuyabæ freirense*, subsp. nov., ♂, Muniz Freire. Left profile view, apex of abdomen.

Fig. 84. *Acanthagrion cuyabæ fimense*, subsp. nov., ♂, Bom Fim. Same.

Figs. 85, 86. *Acanthagrion cuyabæ*, sp. nov., ♂, Cuyabá. 85, dorsal view of superior appendages; 86, left profile view, apex of abdomen.

Fig. 87. *Acanthagrion truncatum* Selys, ♂, Chapada. Left profile view, apex of abdomen.

Figs. 88, 89. *Acanthagrion chararum*, sp. nov., ♂, Cuyabá. 88, left profile view, apex of abdomen. 89, dorsal view of superior apendages.

Figs. 90, 91. *Acanthagrion chacoënse*, sp. nov., ♂, Piedra Blanca. 90, dorsal view of superior appendages; 91, left profile view, apex of abdomen.

Fig. 92. *Acanthagrion temporale* Selys. ♂, left profile view, apex of abdomen.

Figs. 93, 94. *Acanthagrion chirihuanum*, sp. nov., Cuyabá. 93, left profile view, apex of abdomen; 94, dorsal view of appendages.

Figs. 95, 96. *Skiallagma simulacrum*, sp. nov., ♂, Cuyabá. 95, dorsal view of appendages; 96, left profile view, apex of abdomen.

Fig. 97. *Acanthagrion ambiguum* Ris, ♀, Villeta. Hind margin of prothorax.

Fig. 98. *Acanthagrion cheliferum*, ♀, Santa Helena. Same.

Fig. 99. *Telebasis corallina* ♂, Bahia. Left profile view, apex of abdomen.

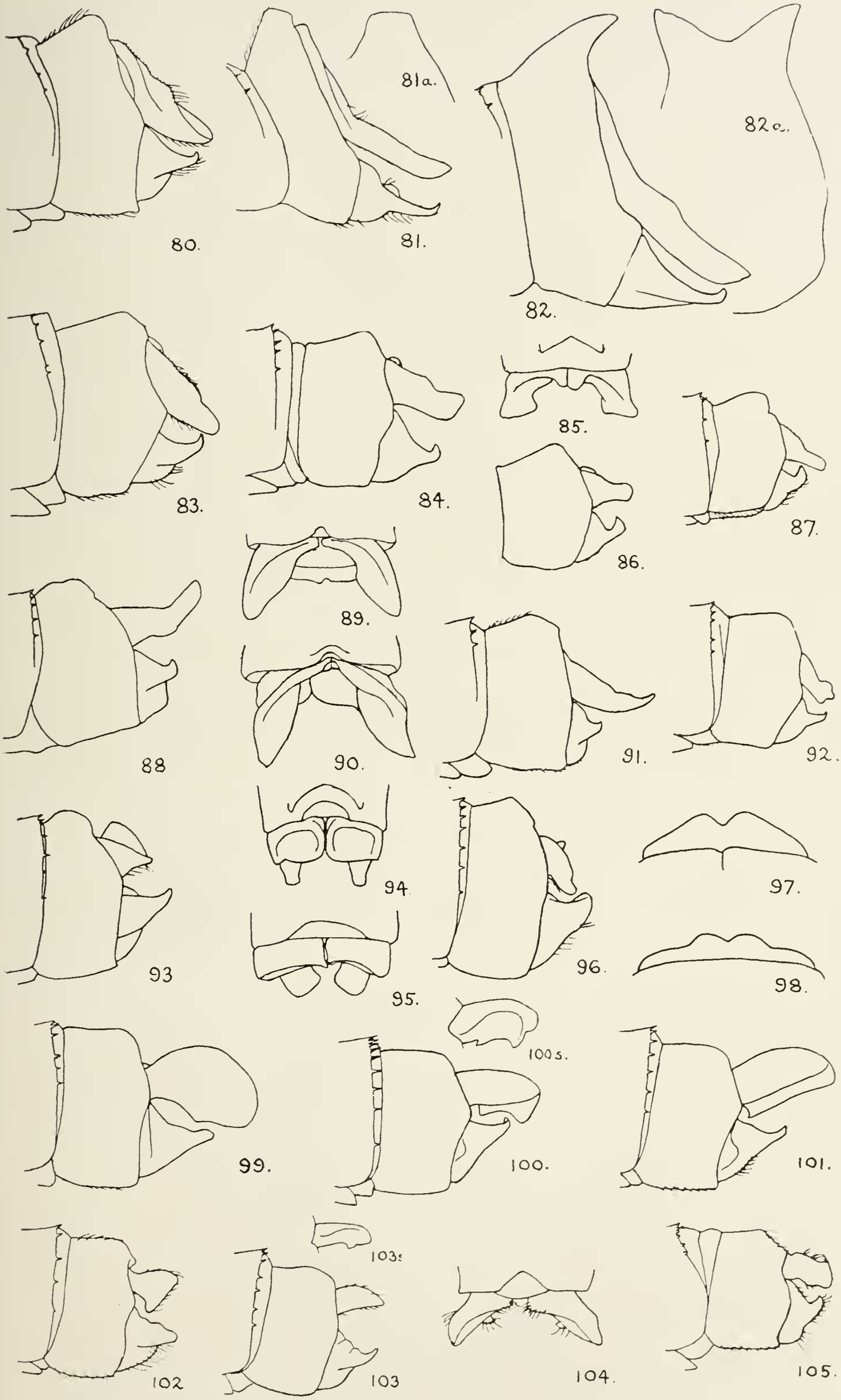
Figs. 100, 100*a*. *Telebasis carmesina*, sp. nov., ♂, Sete Lagoas. 100 same as 99. 100*s*, inner surface, right superior appendage.

Fig. 101. *Telebasis sanguinalis*, sp. nov., ♂, Chapada. Same as 99.

Fig. 102. *Telebasis carminita*, sp. nov., ♂, Cuyabá. Same as 99.

Figs. 103, 103*s*. *Telebasis coccinata*, sp. nov., ♂, Chapada. 103 same as 99; 103*s*, supero-internal view of right superior appendage.

Figs. 104, 105. *Tigriagrion aurantinigrum*, sp. nov., ♂, Chapada. 104, dorsal view of appendages; 105, left profile view, apex of abdomen.



Acanthagrion, Skiallagma, Telebasis, and Tigriagrion.

PLATE VI.

FIGS. 106, 107. *Metaleptobasis diceras*, Selys, ♂, Bahia. 106, left profile view hind prothoracic lobe and mesothoracic horn; 107, dorsal view of same.

FIGS. 108, 109. *Metaleptobasis bicornis?* Selys, ♂, Chapada. Like 106 and 107.

FIGS. 110, 111. *Metaleptobasis cornicauda*, sp. nov., ♂, Bahia. 110, left profile view, apex of abdomen; 111, dorsal view of appendages.

FIGS. 112, 113, 115–117. *Leptobasis mammilaris*, sp. nov., ♂, Chapada, ♀ Rio de Janeiro. 112, dorsal view of appendages ♂; 113, left profile view of apex of abdomen ♂; 115, like 106 and 108, ♂; 116, like 107 and 109, ♂; 117, hind prothoracic lobe, ♀, from in front.

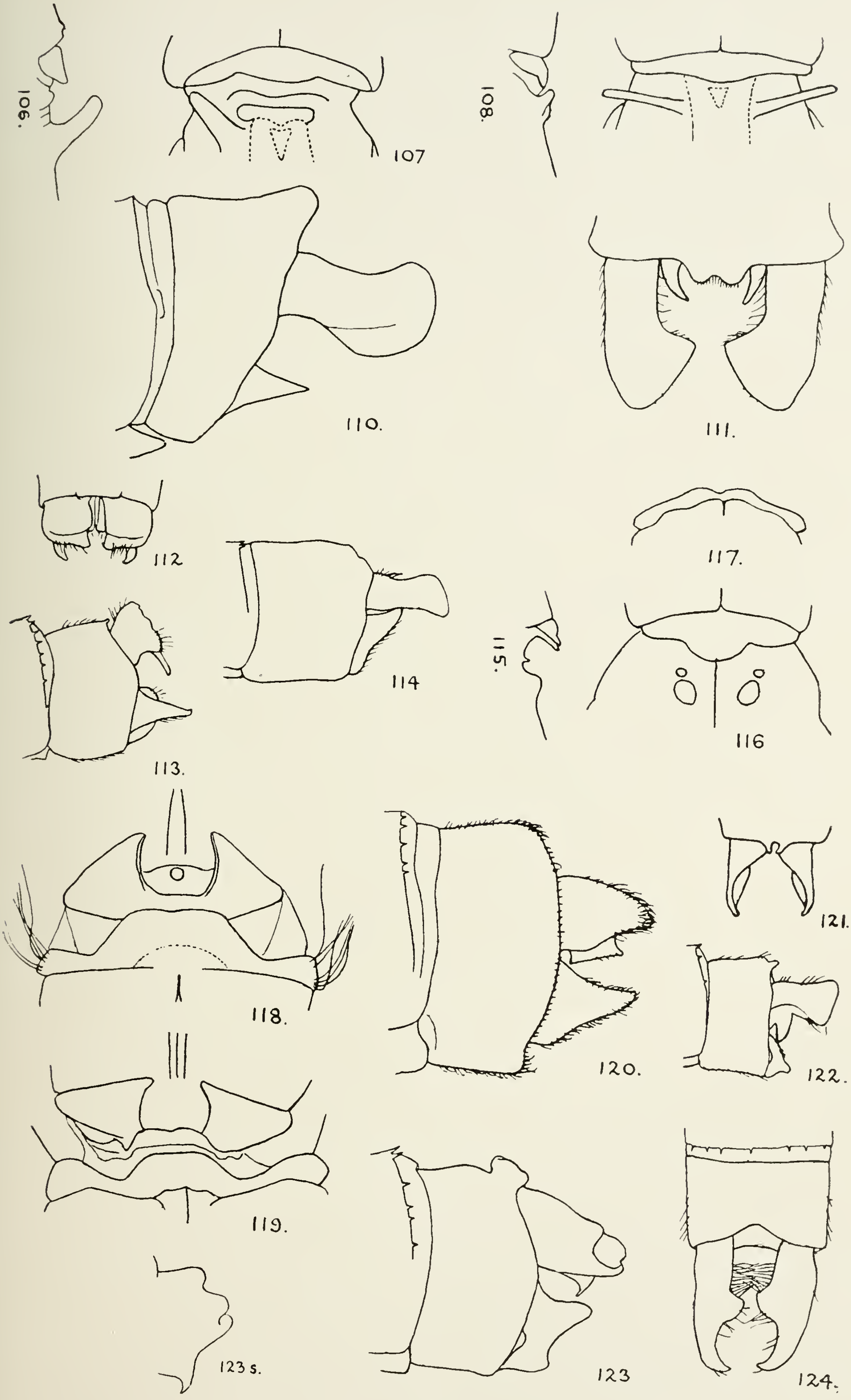
FIG. 114. *Metaleptobasis diceras* Selys, ♂, Bahia. Left profile view, apex of abdomen.

FIGS. 118–120. *Amphiagrion titicacæ*, sp. nov., Puno. 118, hind prothoracic lobe and mesostigmal laminæ from in front, ♂; 119, same, ♀; 120, left profile view, apex of abdomen, ♂.

FIGS. 121, 122. *Ischnura? nepos* Selys, ♂, Piedra Blanca. 121, dorsal view of appendages; 122, left profile view, apex of abdomen.

FIGS. 123, 123*s*. *Enallagma? ovigerum*, sp. nov., ♂, Sta. Fe de Bogota. 123, left profile view, apex of abdomen; 123*s*, inner surface of right superior appendage.

FIG. 124. *Peristicta æneoviridis*, sp. nov., ♂, Sapucay. Dorsal view, apex of abdomen.



Metaleptobasis, Amphiagrion, Ischnura, Enallagma, and Peristicta.

PLATE VII.

FIG. 125. *Gomphoides hesperus*, sp. nov., ♂, Quevedo, Ecuador. Left profile view apical segments of abdomen. 125*s*, apex of one superior appendage viewed from above and behind, more highly magnified.

FIG. 126. *Gomphoides viridipleuris*, sp. nov., ♂. Sapucay, December, like 125. 126*s*, apex of left superior appendage in dorsal view, more highly magnified.

FIG. 127. *Gomphoides camposi*, sp. nov., ♂, Queredo, Ecuador; like 125.

FIG. 128. *Progomphus recticarinatus*, sp. nov., ♂, Chapada. Left profile view, apex of abdomen.

FIG. 129. *Progomphus intricatus* Selys, ♂, Chapada; like 128.

FIG. 130. *Micrathyria ocellata dentiens*, sp. nov., ♂, Bom Fim, Nov. 2; like 128.

FIG. 131. *Dorocordulia errans*, sp. nov., ♂, Chapada? like 128.

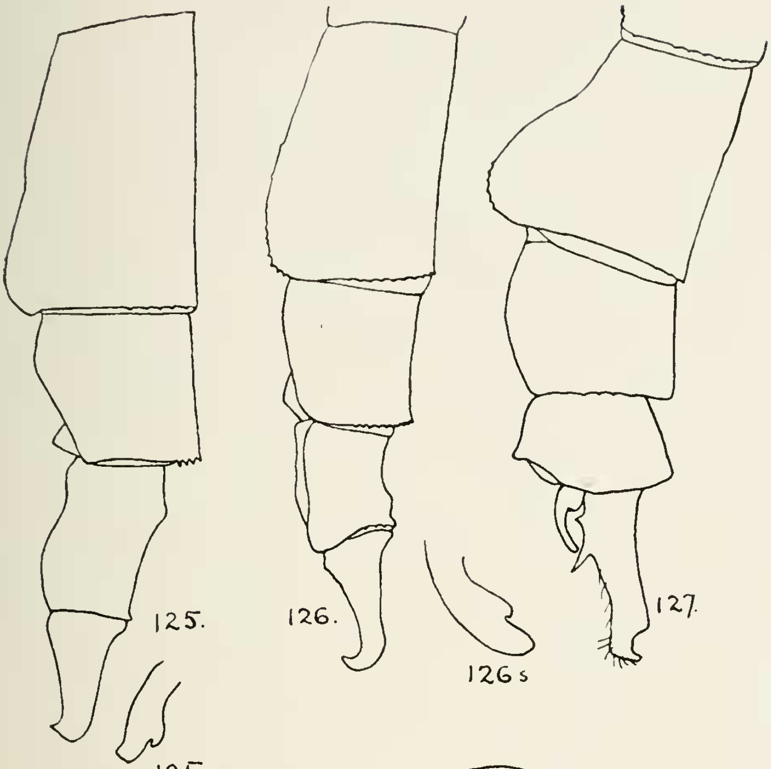
FIGS. 132, 133. *Neocordulia volxemi* Selys, ♂, Chapada. 132, left profile view of appendages; 133, dorsal view, apex of abdomen.

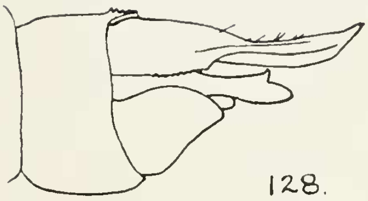
FIG. 134. *Micrathyria spinifera*, sp. nov., ♂, Surinam. Left profile view, genitalia of abdominal segment 2.

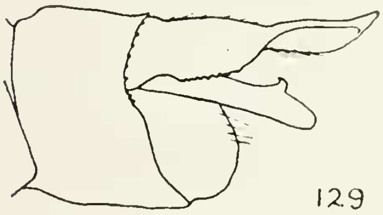
FIG. 135. *Micrathyria dythemoides*, sp. nov., ♂, Surinam; same as fig. 134. The hamules are broken as indicated by dotted lines.

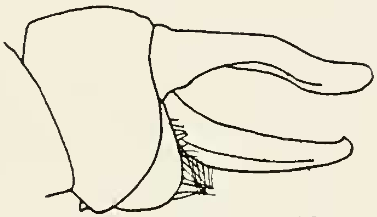
FIG. 136. *Micrathyria macrocercis*, sp. nov., ♂, Cachoeira. Left profile view, apex of abdomen.

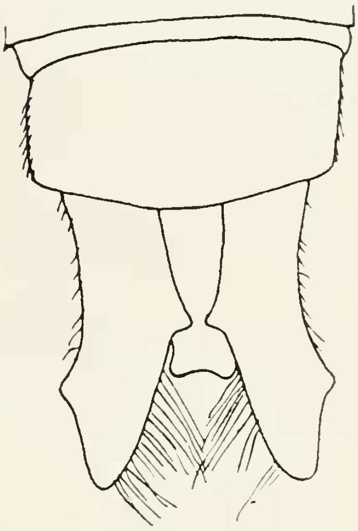
FIGS. 137, 138. *Macrothemis declivata*, sp. nov., ♂, Rio de Janeiro. 137, left profile view, apex of abdomen; 138, dorsal view, left superior appendage.

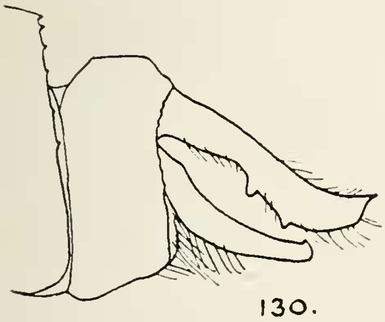


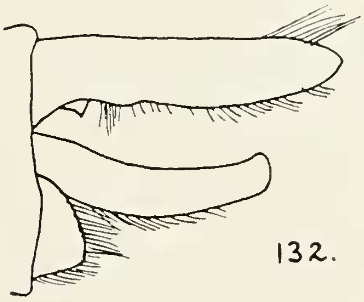


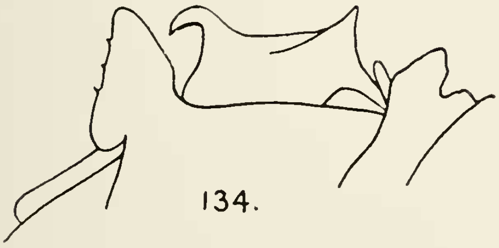


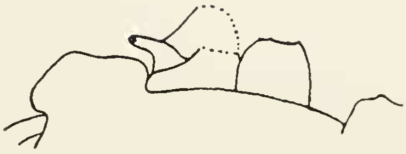


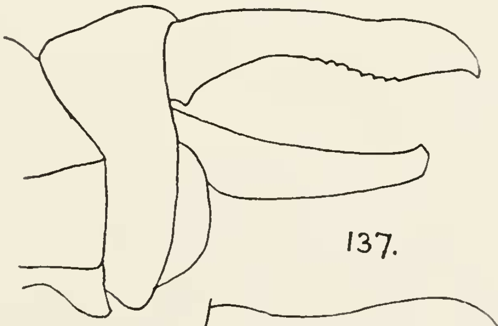


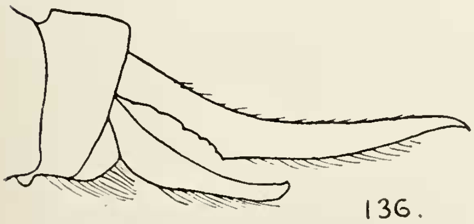


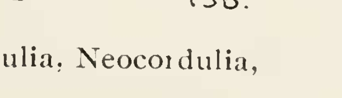










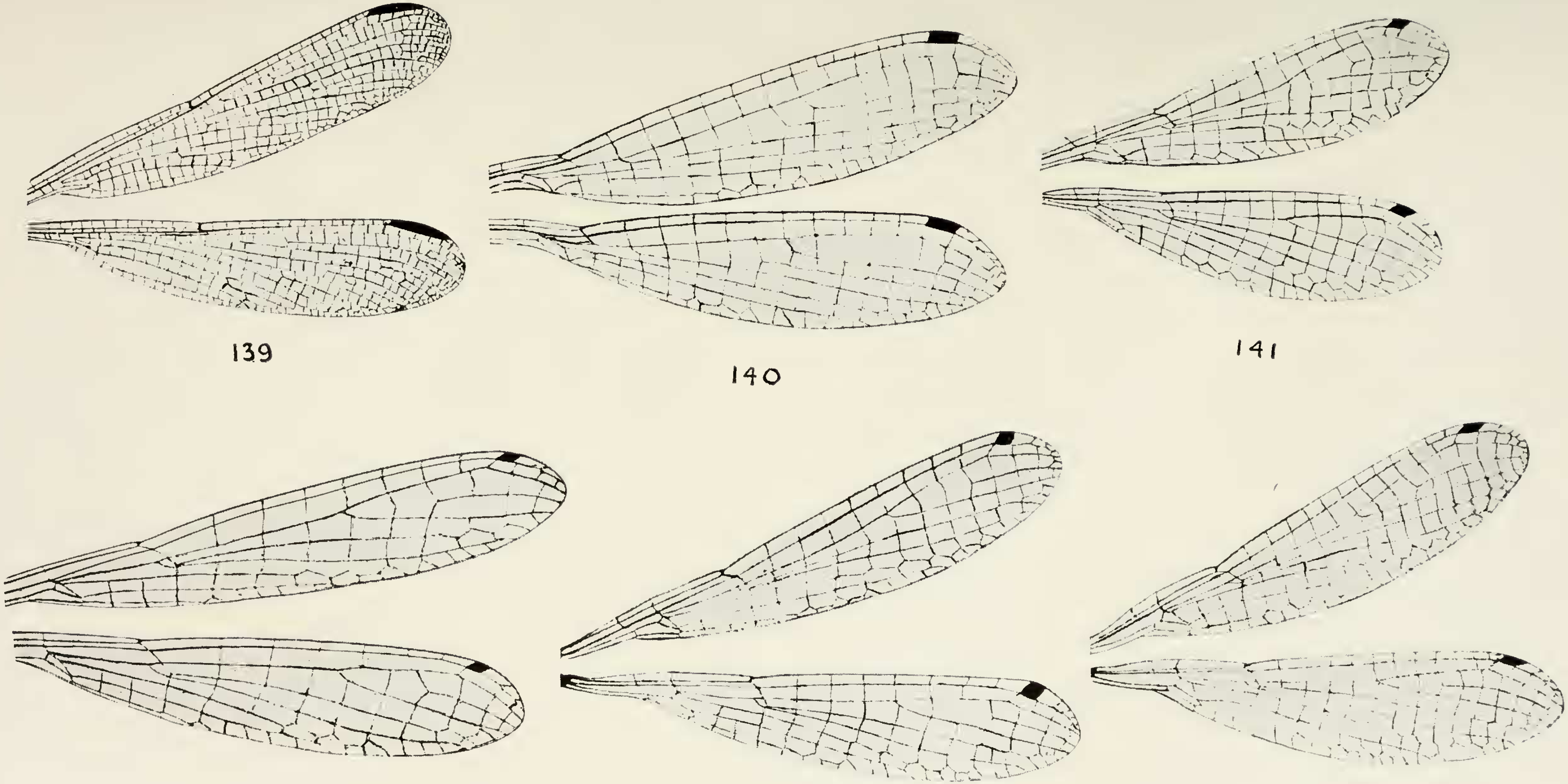


Gomphoides, Progomphus, Micrathyria, Dorocordulia, Neocordulia, and Macrothemis.

PLATE VIII.

(Venation of Wings from Photographs by Dr. H. G. Kribs.)

FIG. 139. *Heliocharis amazona*, Selys, ♂, Chapada.
FIG. 140. *Perilestes fragilis ?* Hagen, Chapada.
FIG. 141. *Diargia bicellulata*, sp. nov., Chapada.
FIG. 142. *Oyagrion evanescens*, sp. nov., Chapada.
FIG. 143. *Tigriagrion aurantinigrum*, sp. nov., Chapada.
FIG. 144 *Argia thisma*, sp. nov , Chapada.



139 140 141

142 143 144

Venation of Wings from Photographs by Dr. H. G. Kribs.

PLATE IX.

FIG. 145. *Uracis ovipositrix*, sp. nov., ♀, Chapada.

FIG. 146. *Gymnothemis venipunctata*, gen. et sp. nov., ♂, Chapada.

FIG. 147. *Brechmorhoga heteronycha*, sp, nov., ♀, Chapada, May.

FIG. 148. *Rhodopygia hollandi* Calvert, ♂, Cuyabá.

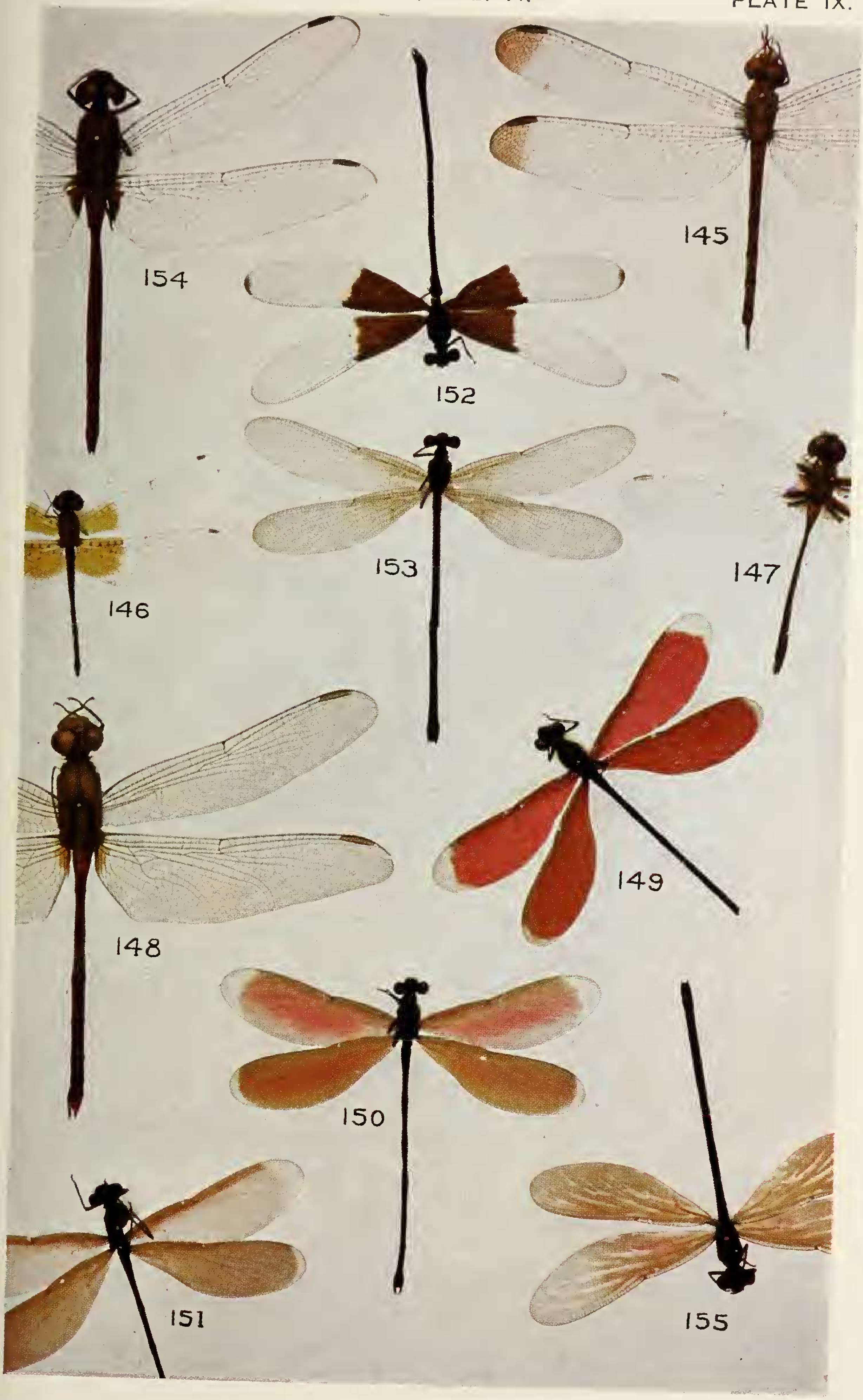
FIGS. 149–151. *Lais pudica* Hagen, Chapada, 3 ♂ of different ages showing the replacement of the brown of the wings of the youngest individuals by red in later life.

FIGS. 152, 153. *Hetærina fuscibasis*, sp. nov., Chapada, ♂ and ♀.

FIG. 154. *Erythemis hæmatogastra* Burmeister, ♂, Cachoeira Cuyabá, January 27. For comparison with *Rhodopygia hollandi* as possible examples of mimicry.

FIG. 155. *Lais pudica* Hagen, ♀, Chapada.

PLATE IX.



SOUTH AMERICAN ODONATA